



*The Journal*

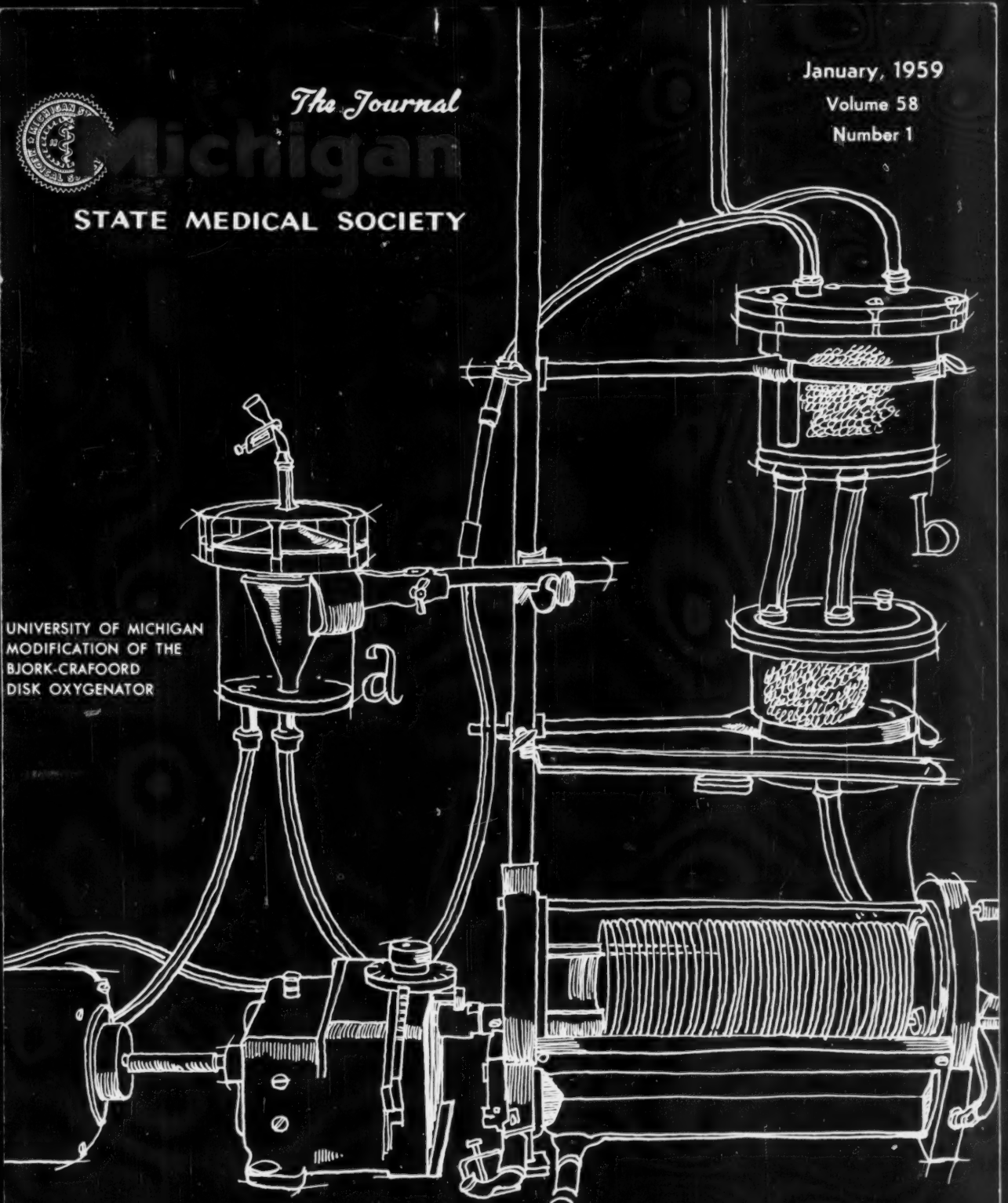
**STATE MEDICAL SOCIETY**

January, 1959

Volume 58

Number 1

UNIVERSITY OF MICHIGAN  
MODIFICATION OF THE  
BJORK-CRAFOORD  
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**michigan heart association**





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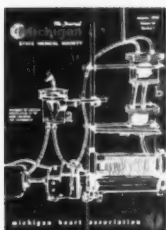
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## The Cover

The cover illustration shows the University of Michigan modification of the Bjork-Crafoord Disk Oxygenator, developed by the Thoracic Staff, University of Michigan Hospital. The bubble trap (A, at left) is a recent and unique design, as is double reservoir coronary sinus return system (B, at right) which can handle large volume at fast flow. The oxygenator project has been supported in part by funds from the Michigan Heart Association.

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JANUARY, 1959

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### REFERENCES:

1. Eisenberg, B. C.: Clinical Medicine 5:897-904 (July) 1958.
2. Feinberg, A. R., et al.: J. Allergy 29:358 (July) 1958.
3. Robinson, H. M., et al.: So. Med. J. 50:1282 (Oct.) 1957.



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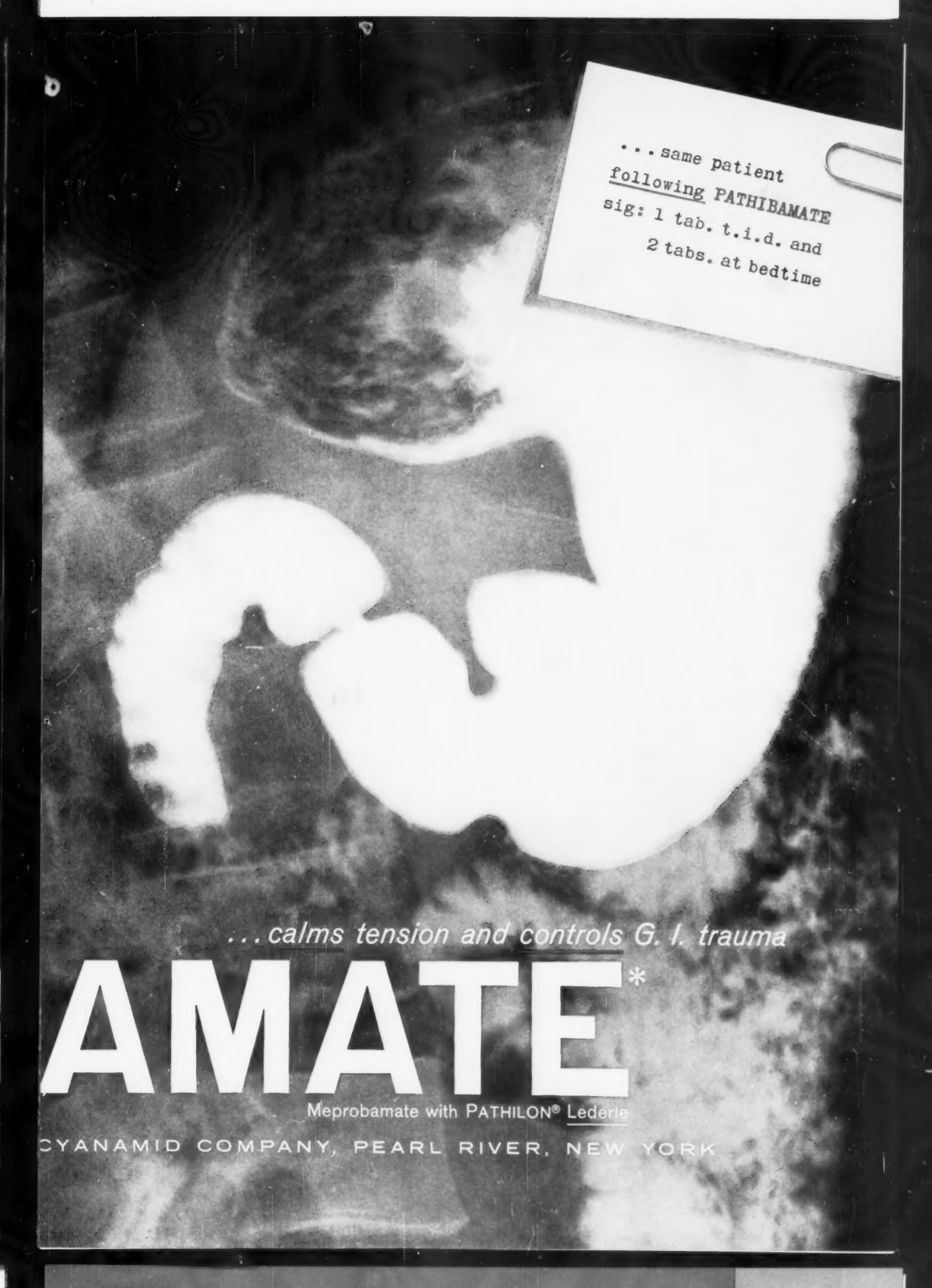
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it could be mild  
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**more potent and comprehensive treatment  
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... assured anti-inflammatory effect of low-dosage corticosteroid<sup>1</sup> ... additive antirheumatic action of corticosteroid plus salicylate<sup>2-5</sup> brings rapid pain relief; aids restoration of function ... wide range of application including the entire fibrositis syndrome as well as early or mild rheumatoid arthritis

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METICORTEN® (prednisone) .....	0.75 mg.
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**References:** 1. Spies, T. D., et al.: J.A.M.A. 159:645, 1955. 2. Spies, T. D., et al.: Postgrad. Med. 17:1, 1955. 3. Gelli, G., and Della Santa, L.: Minerva Pediat. 7:1456, 1955. 4. Guerra, F.: Fed. Proc. 12:326, 1953. 5. Busse, E. A.: Clin. Med. 2:1105, 1955. 6. Sticker, R. B.: Panel Discussion, Ohio State M. J. 52:1037, 1956.

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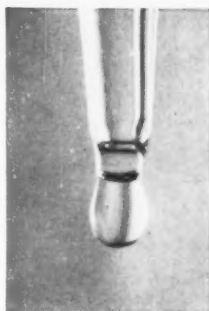
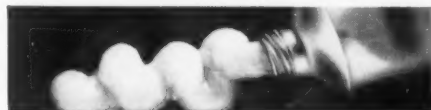
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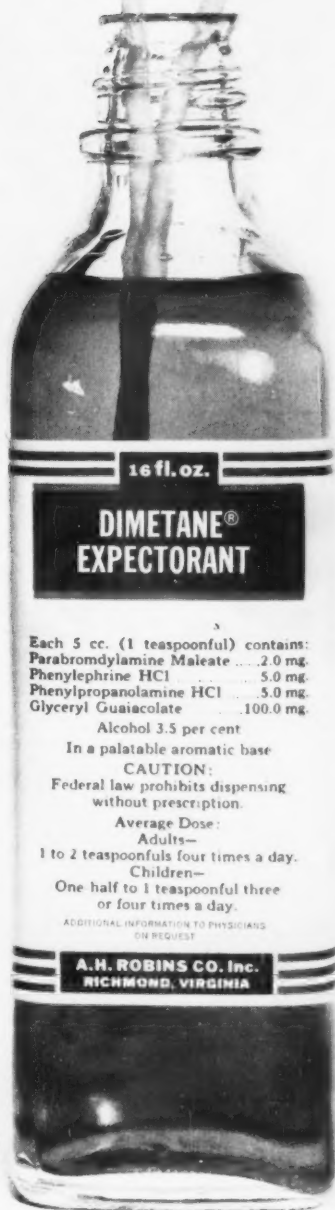


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works  
better

combines the unsurpassed antihistamine Dimetane with the clinically proven expectorant glyceryl guaiacolate (which increases R.T.F. almost 200%) and two recognized decongestants. When additional cough suppressant action is indicated, prescribe DIMETANE EXPECTORANT-DC, which provides the basic formula with dihydrocodeinone bitartrate 1.8 mg. per 5 cc. (exempt narcotic).

**Dimetane® Expectorant**   
**Dimetane® Expectorant-DC**

(WITH DIHYDROCODEINONE BITARTRATE 1.8 MG./5CC.)



## Heart Beats

### HEART RESEARCH GRANTS ANNOUNCED

For the fiscal year 1958-1959, the Michigan Heart Association will spend more than \$317,000 in support of heart research in Michigan. This sum is more than half of the operating funds of the Association.

F. D. Dodrill, M.D., President of the Michigan Heart Association recently announced the names of Responsible Investigators for Cardiovascular research projects supported by the Association during this fiscal year. Slightly more than \$246,000 has been appropriated for the thirty-five project Grants-in-Aid. This support is possible through the funds received from the Michigan United Fund and contributions to the Michigan Heart Association Memorial Fund.

"One need only look at the progress of the last decade to realize the contributions that cardiovascular research has made," Dr. Dodrill said, adding: "The sponsorship of more projects has been made possible largely by increased contributions to the Memorial Fund by persons who choose 'giving' as a means of honoring birthdays, anniversaries, or as a way of creating a living memorial in the name of a friend or relative. . . . Through research we are meeting the challenge of heart disease, because of the generosity of the people of Michigan, we are able to meet the challenge of research."

Of the research funds allocated, \$117,000 has been provided from the Association's Memorial Fund. No administrative expense is charged against this fund, it is used solely for cardiovascular research studies.

Responsible Investigators who have received Project Grants-in-Aid for the year 1958-1959 are:

William T. Beher, Ph.D., Henry Ford Hospital, Detroit  
James B. Blodgett, M.D., Grace Hospital, Detroit  
David F. Bohr, M.D., University of Michigan, Ann Arbor  
Albert J. Boyle, M.D., Wayne State University, Detroit  
E. J. Cafruny, Ph.D., University of Michigan, Ann Arbor  
N. E. Clarke, M.D., Providence Hospital, Detroit  
Lewis Cohen, M.D., Sinai Hospital, Detroit  
F. D. Dodrill, M.D., Harper Hospital, Detroit  
Ivan F. Duff, M.D., University of Michigan, Ann Arbor  
Harold F. Hardman, Ph.D., University of Michigan, Ann Arbor  
Harper K. Hellem, M.D., Wayne State University, Detroit  
Thomas B. Hill, M.D., Lowell Public Schools, Lowell, Michigan  
Fred J. Hodges, M.D., University of Michigan, Ann Arbor  
S. W. Hoobler, M.D., University of Michigan, Ann Arbor  
Joseph J. Jasper, Ph.D., Wayne State University, Detroit  
S. A. Johnson, Ph.D., Henry Ford Hospital, Detroit  
Charles G. Johnston, M.D., Wayne State University, Detroit

Joseph A. Johnston, M.D., Henry Ford Hospital, Detroit  
Jon J. Kabara, Ph.D., University of Detroit, Detroit  
Sidney D. Kobernick, M.D., Sinai Hospital, Detroit  
Conrad R. Lam, M.D., Henry Ford Hospital, Detroit  
Benjamin M. Lewis, M.D., Wayne State University, Detroit  
Yoshikazu Morita, M.D., Wayne State University, Detroit  
Jan Nyboer, M.D., Harper Hospital, Detroit  
Bradley M. Patten, Ph.D., University of Michigan, Ann Arbor  
Edward M. Priest, M.D., Henry Ford Hospital, Detroit  
Edward L. Quinn, M.D., F.A.C.P., Henry Ford Hospital, Detroit  
Fred L. Rights, Ph.D., Wayne State University, Detroit  
Paul A. Rondell, Ph.D., University of Michigan, Ann Arbor  
Herbert Sloan, M.D., University of Michigan, Ann Arbor  
D. Emerick Szilagyi, M.D., Henry Ford Hospital, Detroit  
N. S. Talner, M.D., University of Michigan, Ann Arbor  
John M. Weller, M.D., University of Michigan, Ann Arbor  
J. L. Wilson, M.D., University of Michigan, Ann Arbor  
R. F. Ziegler, M.D., Henry Ford Hospital, Detroit  
Wolf W. Zuelzer, M.D., Child Research Center of Michigan, Detroit

### DEAN'S FUNDS AND STUDENT FELLOWSHIPS

The Dean's Funds established at the University of Michigan School of Medicine and Wayne State University College of Medicine were created to aid in whatever way the Dean of each Medical School sees best in order to retain competent men in academic medicine on completion of their residency or fellowship training. Individuals to be supported are nominated by the Deans and then reviewed by the Dean's Fund Committee of the Michigan Heart Association. All candidates must be medical doctors who will engage in research in cardiovascular diseases. \$30,000 has been awarded to the Dean of each medical school for the current year.

During the year 1957-1958, fifteen Summer Medical Student Fellowships at \$600 were given, seven at the University of Michigan School of Medicine and eight at Wayne State University College of Medicine. Two of those from the University of Michigan have been continued into the current fiscal year because of the promising work of their project: bypassing the aorta during reconstructive operations on the arch of the aorta. This continuation will permit completion of the project. Two more Medical Student Fellowships have already been granted and more will be available for the vacation period next summer.

The Student Fellowship Program should be

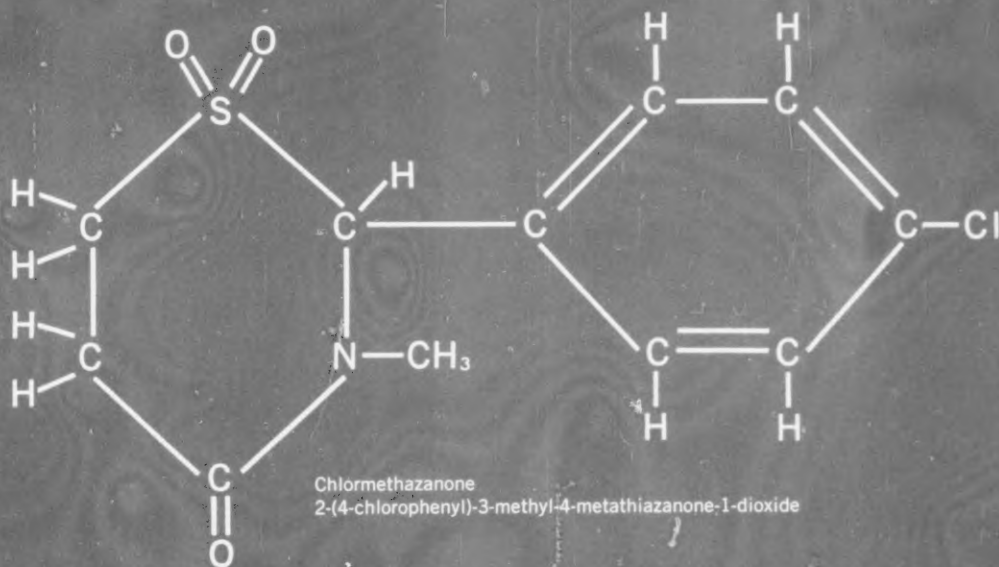
(Continued on Page 26)

Winthrop Laboratories  
introduces

# Trancopal<sup>®</sup>

BRAND OF CHLORMETHAZANONE

*a completely new major chemical contribution to therapeutics*



*unrelated chemically to any  
other drug in current use*



designed to be equally effective as both

a **MUSCLE RELAXANT**

a **TRANQUILIZER**

# Trancopal

the first true "TRANQUILAXANT"\*

offering new freedom for your patients... from muscle spasm,  
from tension and anxiety, from side effects

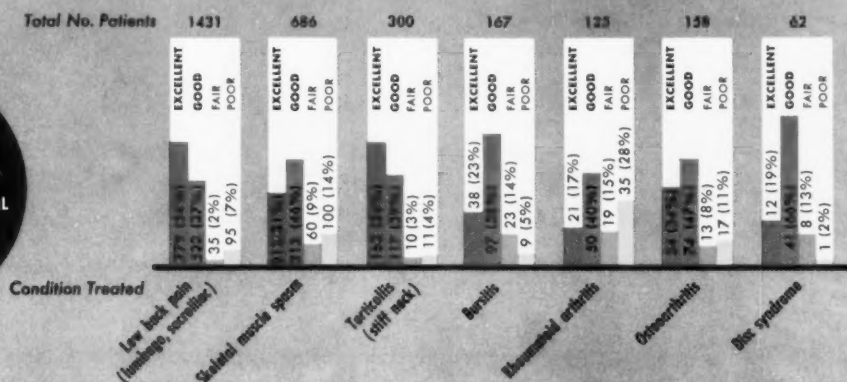
\*tran-qui-lax-ant (tran'kwi-lak'sant)

[ < L. *tranquillus*, quiet; L. *laxare*, to loosen, as the muscles ]

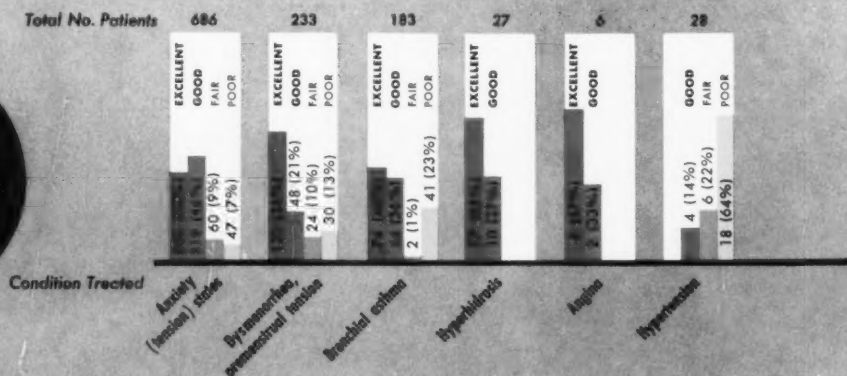
**EXCEEDS OLDER DRUGS UP TO 4 TIMES IN PERCENTAGE OF CLINICAL EFFICACY** (Lichtman)

The results of clinical studies of over 4000 patients by 105 physicians demonstrate that TRANCOPAL often is effective when other drugs have failed. From these studies it is clear that TRANCOPAL probably can provide more help for a greater number of tense, spastic, and/or emotionally upset patients than any other chemotherapeutic agent in current use.

## TRANCOPAL IN MUSCULOSKELETAL DISORDERS



## TRANCOPAL IN PSYCHOGENIC DISORDERS



Compare Trancopal with 3 widely  
used central relaxants

## TRANCOPAL...the first true "tranquilaxant"

Both a muscle relaxant and a calmative agent.

In musculoskeletal disorders, 91 per cent effective.

In anxiety and tension states, 93 per cent effective.

Lower incidence of side effects than with zoxazolamine, methocarbamol or meprobamate.

No known contraindications. Blood pressure, pulse rate, respiration and digestive processes unaffected by therapeutic dosage. No effects on hematopoietic system or liver and kidney function.

Low toxicity. In animals, even less toxic than aspirin.

No gastric irritation. Can be taken before meals.

No clouding of consciousness, no euphoria or depression.

No perceptible soporific effect, even in high dosage.

### CLINICAL RESULTS IN 4092 PATIENTS



MUSCULOSKELETAL CONDITIONS  
2929 Patients

+

=



PSYCHOGENIC CONDITIONS  
1163 Patients



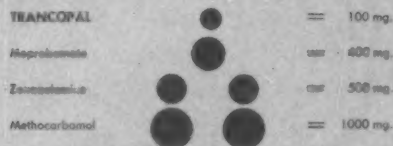
TOTAL 4092 Patients

**MAJOR IMPROVEMENT**  
**84%**

## Compare Trancopal with 3 widely used central relaxants

### FOR ACTIVITY

Single Dose

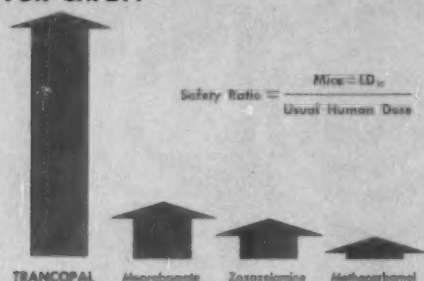


Daily Dose

Same as above, t.i.d.

Considering the usual human dose, Trancopal, the first true "tranquilaxant," is four to ten times as potent per milligram.

### FOR SAFETY



Comparative pharmacologic tests showed that Trancopal is up to thirteen times as safe, or up to thirteen times less toxic. The measure of safety was the LD<sub>50</sub> in mice/usual human dose.

### FOR CLINICAL EFFECTIVENESS



A clinical comparison in low back pain, torticollis, bursitis and anxiety states showed that Trancopal is up to four times as effective. Each of 40 patients received all four drugs in random rotation for several days. While each of the four drugs gave some relief, only the one providing the most effective relief was recorded.

#### INDICATIONS

##### Musculoskeletal

Low back pain (lumbago)  
Neck pain (torticollis)  
Bursitis  
Rheumatoid arthritis  
Osteoarthritis  
Disc syndrome  
Fibrositis  
Joint disorders (ankle sprain, tennis elbow, etc.)  
Myositis  
Postoperative myalgias

##### Psychogenic

Anxiety and tension states  
Dysmenorrhea  
Premenstrual tension  
Asthma  
Emphysema  
Angina

##### Neurologic

Muscle spasm in paralysis agitans, multiple sclerosis, hemiplegia, poliomyelitis

## TRANCOPAL thoroughly evaluated clinically

"In the treatment of conditions associated with skeletal muscle spasm there was a high percentage of satisfactory results (excellent, good or fair) in 310 patients (94%) out of 331 treated. . . . In 120 patients with simple anxiety or tension states results were satisfactory in 114 (95%). Dosage of chlormethazone in all cases was 100 mg. t.i.d. As well as relieving the anxiety or tension state, chlormethazone also allowed these patients to resume their usual occupations." (Lichtman)

# Trancopal

the first true "TRANQUILAXANT"

**Dosage:** One Caplet (100 mg.) orally three or four times daily. Relief of symptoms occurs in fifteen to thirty minutes and lasts from four to six hours.

**Supplied:** Trancopal Caplets® (scored) 100 mg., bottles of 100.

Winthrop Laboratories • New York 18, N. Y.

• Baker, A. B.: *Modern Med.* 26:140, April 15, 1958. • Cohen, A. I.: In preparation. • Cooperative Study, Department of Medical Research, Winthrop Laboratories. • Gesler, R. M., and Coulston, F.: *Toxicol. & Appl. Pharmacol.* To be published. • Gesler, R. M., and Surrey, A. R.: *J. Pharmacol. & Exper. Therap.* 122:24A, Jan., 1958. • Gesler, R. M., and Surrey, A. R.: *J. Pharmacol. & Exper. Therap.* 122:517, April, 1958. • Lichtman, A. L.: *Kentucky Acad. Gen. Pract. J.* 4:28, Oct., 1958. • Surrey, A. R.; Webb, W. G., and Gesler, R. M.: *J. Am. Chem. Soc.* 80:3469, July 5, 1958.



in every  
arthritic<sup>®</sup> state...

## **maintenance therapy is still fundamental treatment<sup>1,2,3</sup>**

Sound, conservative therapy with salicylates has been consistently reaffirmed as basic, long-term maintenance therapy in the arthritides.

Buffered Pabirin provides superior maintenance therapy. It epitomizes fundamental long-term basic therapy since it can be given month after month without serious complications and with minimal problems to patient and doctor alike.

Buffered Pabirin is formulated to provide high and sustained salicylate blood levels. Each tablet consists of an outer layer containing a buffer (aluminum hydroxide), para-aminobenzoic acid, and ascorbic acid; a core of acetylsalicylic acid.

In the stomach, the outer layer quickly releases the buffer, which protects against nausea, dyspepsia and other gastrointestinal symptoms so frequently encountered with salicylates alone. The core of Buffered Pabirin then disintegrates rapidly, permitting rapid absorption of the acetylsalicylic acid for faster pain relief.

References: 1. Hart, D.; Bagnall, A. W.; Bunim, J. J., and Polley, F. H.: Ninth International Congress on Rheumatic Diseases, Toronto, Ont. (June 25) 1957. 2. Report of Joint Committee, Medical Research Council & Nuffield Foundation, Treatment of Rheumatoid Arthritis, British Medical Journal (April 13) 1957. 3. Friend, D. G.: New England J. Med. 257:278 (Aug.) 1957.

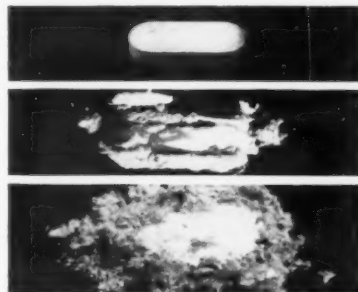
## *Buffered* **Pabirin<sup>®</sup>** *Tablets*

Each tablet contains:

Acetylsalicylic acid (5 gr.).....	300 mg.
Para-aminobenzoic acid (5 gr.).....	300 mg.
Ascorbic acid.....	50 mg.
Dried aluminum hydroxide gel.....	100 mg.

All Buffered Pabirin is sodium- and potassium-free.

Dosage: Two or three tablets 3 or 4 times daily.



*Photographs show 2-stage  
Tandem Release disintegration.*



# Investigator

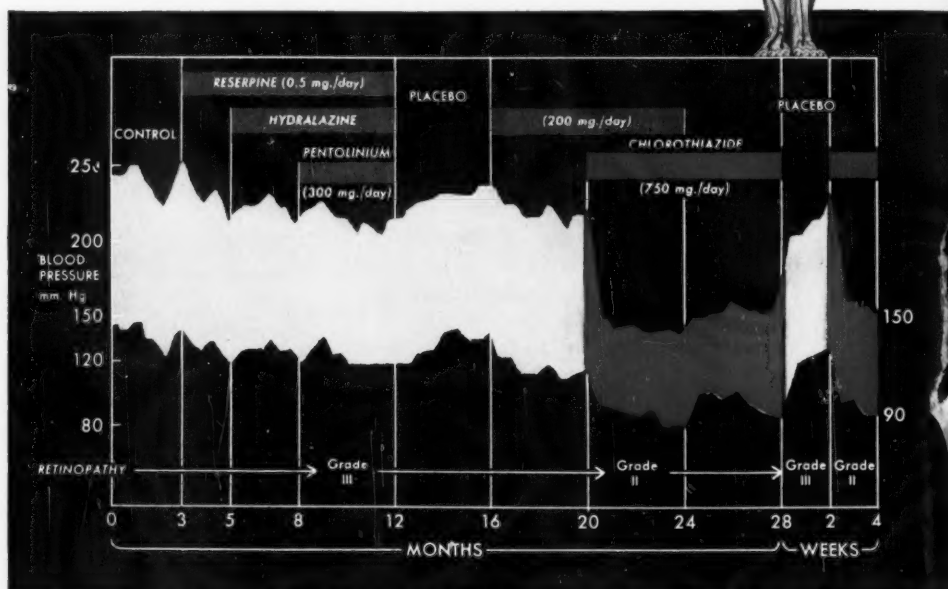
## after investigator reports

Wilkins, R. W.: New England J. Med. 257:1026, Nov. 21, 1957.

"Chlorothiazide added to other antihypertensive drugs reduced the blood pressure in 19 of 23 hypertensive patients." "All of 11 hypertension subjects in whom splanchnicectomy had been performed had a striking blood pressure response to oral administration of chlorothiazide." "... it is not hypotensive in normotensive patients with congestive heart failure, in whom it is markedly diuretic; it is hypotensive in both compensated and decompensated hypertensive patients (in the former without congestive heart failure, it is not markedly diuretic, whereas in the latter in congestive heart failure, it is markedly diuretic). ..."

Freis, E. D., Wanko, A., Wilson, I. H. and Parrish, A. E.: J.A.M.A. 166:137, Jan. 11, 1958.

"Chlorothiazide (maintenance dose, 0.5 Gm. twice daily) added to the regimen of 73 ambulatory hypertensive patients who were receiving other antihypertensive drugs as well caused an additional reduction [16%] of blood pressure." "The advantages of chlorothiazide were (1) significant antihypertensive effect in a high percentage of patients, particularly when combined with other agents, (2) absence of significant side effects or toxicity in the dosages used, (3) absence of tolerance (at least thus far), and (4) effectiveness with simple 'rule of thumb' oral dosage schedules."



In "Chlorothiazide: A New Type of Drug for the Treatment of Arterial Hypertension,"

Hollander, W. and Wilkins, R. W.: Boston Med. Quart. 8: 1, September, 1957.

**MERCK SHARP & DOHME**

Division of MERCK & CO., Inc., Philadelphia 1, Pa.





the effectiveness of **'DIURIL'**  
(CHLOROTHIAZIDE)

in

# Hypertension

*as simple as 1-2-3*

**1 INITIATE THERAPY WITH 'DIURIL'.** 'DIURIL' is given in a dosage range of from 250 mg. twice a day to 500 mg. three times a day.

**2 ADJUST DOSAGE OF OTHER AGENTS.** The dosage of other antihypertensive medication (reserpine, veratrum, hydralazine, etc.) is adjusted as indicated by patient response. If the patient is established on a ganglionic blocking agent (e.g., 'INVERSINE') this should be continued, but the total daily dose should be immediately reduced by as much as 25 to 50 per cent. This will reduce the serious side effects often observed with ganglionic blockade.

**3 ADJUST DOSAGE OF ALL MEDICATION.** The patient must be frequently observed and careful adjustment of all agents should be made to determine optimal maintenance dosage.

**SUPPLIED:** 250 mg. and 500 mg. scored tablets 'DIURIL' (chlorothiazide); bottles of 100 and 1,000.

'DIURIL' is a trade-mark of Merck & Co., Inc.

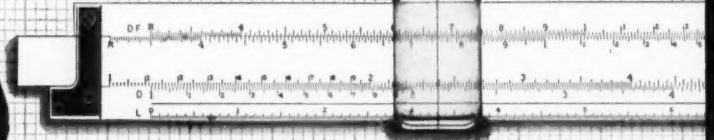
Smooth, more trouble-free management of hypertension with 'DIURIL'

PRONOUNCED TAY-O

# R<sub>x</sub> Tao

(triacycloleandomycin)  
Capsules / Oral Suspension

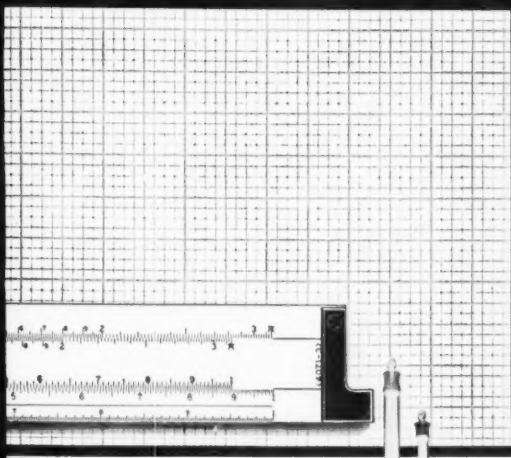
\* designed for  
superior control of  
common Gram-positive  
infections



in the  
patient:

95% effective in published cases<sup>1-3</sup>

Conditions treated	No. of Patients	Cured	Improved	Failure
<b>ALL INFECTIONS</b>	<b>558</b>	<b>448</b>	<b>80</b>	<b>30</b>
<b>Respiratory infections</b>	<b>258</b>	<b>200</b>	<b>31</b>	<b>19</b>
Pharyngitis and/or tonsillitis	65	58	5	2
Pneumonia	90	66	17	7
Infectious asthma	44	38	—	6
Otitis media	31	29	2	—
Other respiratory (bronchitis, bronchiolitis, bronchiectasis, pneumonitis, laryngotracheitis, strep throat)	28	17	7	4
<b>Skin and soft tissue infections</b>	<b>230</b>	<b>181</b>	<b>38</b>	<b>1</b>
Infected wounds, incisions and lacerations	41	33	8	—
Abscesses	51	43	8	—
Furunculosis	58	51	6	1
Acne, pustular	43	28	15	—
Pyoderma	19	19	—	—
Other skin and soft tissue (infected burns, cellulitis, impetigo, ulcers, others)	18	17	1	—
<b>Genitourinary infections</b>	<b>28</b>	<b>19</b>	<b>3</b>	<b>6</b>
Acute pyelitis and cystitis	10	8	2	—
Urethritis with gonorrhea or cystitis	8	6	—	—
Pyelonephritis	4	1	—	3
Salpingitis	5	1	1	3
Pelvic inflammation with endometriosis	1	1	—	—
<b>Miscellaneous</b> (adenitis, enteritis, enterocolitis, subacute bacterial endocarditis, fever, hematoma, staphylococcus carriers, osteomyelitis, tenosynovitis, septic arthritis, acute bursitis, peri-arthritis)	<b>42</b>	<b>30</b>	<b>8</b>	<b>4</b>

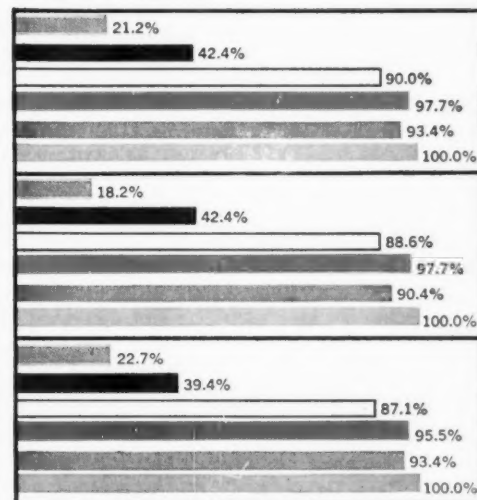


## in the laboratory:



**over 90% effective  
against resistant staph**

COMPARATIVE TESTS BY THREE METHODS  
(DISC, TUBE DILUTION, CYLINDER PLATE)  
ON 130 STAPHYLOCOCCI\*



Antibiotic A 2-10 units    TAO 2-15 mcg.  
Antibiotic B 5-30 mcg.    Antibiotic D 2-15 mcg.  
Antibiotic C 5-30 mcg.    Antibiotic E 5-30 mcg.

Percentage of organisms inhibited by the range of concentrations listed for each antibiotic.

### Other Tao advantages:

**Rapidly absorbed**—stable in gastric acid,<sup>7</sup> TAO needs no retarding protective coating

**Low in toxicity**—freedom from side effects in 96% of patients treated; cessation of therapy is rarely required

**Highly palatable**—"practically tasteless"<sup>7</sup> active ingredient in a pleasant cherry-flavored medium.

**Dosage and Administration:** Dosage varies according to the severity of the infection. For adults, the average dose is 250 mg. q.i.d.; to 500 mg. q.i.d. in more severe infections. For children 8 months to 8 years, a daily dose of approximately 30 mg./Kg. body weight in divided doses has been found effective. Since TAO is therapeutically stable in gastric acid, it may be administered without regard to meals.

**Supplied:** TAO Capsules—250 mg. and 125 mg., bottles of 60. TAO for Oral Suspension—1.5 Gm., 125 mg. per teaspoonful (5 cc.) when reconstituted; unusually palatable cherry flavor; 2 oz. bottle.

**References:** 1. Koch, R., and Asay, L. D. J. *Pediatr.*, in press. 2. Leming, B. H., Jr., et al.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958. 3. Meliman, et al.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958. 4. Olansky, S., and McCormick, G. E., Jr.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958. 5. Shubin, H., et al.: *Antibiotics Annual 1957-1958*, New York, N. Y.: Medical Encyclopedia, Inc., 1958, p. 679. 6. Isenberg, H., and Karellitz, S.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958. 7. Wennersten, J. R.: *Antibiotic Med. & Clin. Therapy* 5:527 (Aug.) 1958. 8. Kaplan, M. A., and Goldin, M.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958. 9. Truant, J. P.: Paper presented at the Symposium on Antibiotics, Washington, D. C., Oct. 15-17, 1958.

### Tao dosage forms— for specific clinical situations

#### Tao Pediatric Drops

For children—flavorful, easy to administer.

**Supplied:** When reconstituted, 100 mg. per cc. Special calibrated droppers—5 drops (approx. 25 mg. of TAO) and 10 drops (approx. 25 mg. of TAO). 10 cc. bottle.

#### TAO-AC (Tao analgesic, antihistaminic compound)

To eradicate pain and physical discomfort in respiratory disorders.

**Supplied:** In bottles of 36 capsules.

#### TAOMID\* (Tao with triple sulfas)

For dual control of Gram-positive and Gram-negative infections.

**Supplied:** Tablets, bottles of 60. Oral Suspension, bottles of 60 cc.

#### Intramuscular or Intravenous

For direct action—in clinical emergencies.

**Supplied:** In 10 cc. vials.

\*TRADEMARK



New York 17, N. Y.  
Division, Chas. Pfizer & Co., Inc.  
Science for the World's Well-Being

## Michigan Relative Value Study Plans Disclosed



L. R. LEADER, M.D.

Specific plans for the development of Michigan's own Relative Value Scale were outlined in detail to more than fifty key doctors of medicine at a dinner meeting on December 6 at the Fort Shelby Hotel in Detroit.

The meeting was sponsored by the Michigan State Medical Society and guests included representatives of Michigan specialty societies, chairmen of Councilor District Medical Care Insurance Committees, MSMS Councilors and Officers.

Featured speakers of the evening were two members of the California Medical Association who contributed much to the development of the California Relative Value Scale. Francis J. Cox, M.D., of San Francisco, chairman of CMA's Commission on Medical Services, explained why the Relative Value Scale was needed in his state and

reviewed the philosophy behind its development. H. Dean Hoskins, M.D., of Oakland, California, chairman of the Commission's Committee on Fee Schedules, reported on how the survey was conducted, detailing the methods and techniques used to obtain a true picture of physician charges—the base point in establishing relative values.

The guest speakers were introduced by Max L. Lichter, M.D., chairman of the MSMS Medical Care Insurance Committee.

On the program was Luther R. Leader, M.D., Detroit, chairman of the MSMS Relative Value Study Committee. Dr. Leader outlined the plans for the Michigan survey and stressed that his committee would work closely with the official representatives of the various Michigan specialty groups. These representatives were appointed by the individual societies at the invitation of the Relative Value Scale Committee.

During an extended question and answer period, guests obtained clarification on specific points of the planned program.

### DEAN'S FUNDS AND STUDENT FELLOWSHIPS

*(Continued from Page 20)*

fruitful in guiding some of these medical students into fields of medical research, and even if they do not, "they will certainly be better doctors and better prepared to make sounder decisions as to medical care because of their research experience during the time of these fellowships," commented Dr. Davenport of the University of Michigan.

In addition, there are two fulltime Research Fellowships to Medical Students at \$4,000 per annum at the University of Michigan.

### MICHIGAN HEART ASSOCIATION TENTH ANNUAL MEETING

The tenth annual Heart "Block" arranged by the Michigan Heart Association for the Michigan Clinical Institute has been scheduled for Thursday morning, March 12, 1959, at 8:30 A. M.

The annual Dinner Meeting of the Michigan Heart Association will be held that same evening in the Book Casino at the Sheraton-Cadillac Hotel. The speaker will be George Wakerlin, M.D., Medical Director of the American Heart Association. Dr. Wakerlin was formerly Professor of Physiology at the University of Illinois. He is known for basic investigation in the field of hypertension.

### CLINICAL SPEAKERS AVAILABLE

The Michigan Heart Association provides clinical programs for county medical society meetings and component unit meetings of the Michigan Academy of General Practice. A "Wet Clinic" is held in the afternoon prior to the meeting in order to provide informal case discussion as well as the usual didactic lecture. Leading clinicians, expenses paid by MHA, can be secured by corresponding with the Medical Director of the Michigan Heart Association.

### MEMBERSHIP

The Michigan Heart Association extends a cordial invitation to all medical doctors to become active members in the Association. A five dollar membership includes automatic membership in the American Heart Association and the following dividends:

A one-year subscription to the following publications:  
*Modern Concepts of Cardiovascular Disease* (issued monthly)

*Heart Research Newsletter* (issued quarterly)

*The American Heart Quarterly*

*Challenge*, Michigan Heart Association Newsletter (quarterly)

Admission to Scientific Sessions of MHA and AHA

New Heart Literature

Membership application and complete details may be obtained by writing to the Michigan Heart Association, Doctor's Building, 3919 John R, Detroit 1, Michigan.

*even when the causative organism  
may be a "persistent staph"*

# Cosa-Signemycin\*

GLUCOSAMINE-POTENTIATED TETRACYCLINE WITH TRIACETYLOLEANDOMYCIN

*increases the certainty of  
safe, rapid response*

**AS PROVED BY** extensive clinical trials—an over-all success rate of more than 94% was achieved in a total of 3,280 cases.†

**AS PROVED BY** success in mixed infections—more than 95% of 1,000 acute and chronic respiratory tract infections were successfully treated; a 99% cure rate was achieved in mixed bacterial pneumonias.†

**AS PROVED BY** effectiveness in "problem infections"—a response rate better than 96% was recorded in a group of 221 gastrointestinal infections including chronic intestinal amebiasis; 91% of 465 urogenital infections were successfully controlled.†

**AS PROVED BY** excellent safety record—extremely well tolerated; discontinuance of medication was necessary in only 11 of 3,280 patients.†

*A significant number of the above cases had not responded  
to other antibiotics.*

*Cosa-Signemycin is particularly valuable in home and office,  
where susceptibility testing is difficult or impractical.*

**SUPPLY:** Capsules (green and white), 250 mg. and 125 mg.

**New Oral Suspension** (raspberry-flavored), 2 oz. bottle, 125 mg. per teaspoonful (5 cc.).

**New Pediatric Drops** (raspberry-flavored), 10cc. bottle, 5 mg. per drop, plastic calibrated dropper.

**Average dosage:** For adults, 1-2 Gm. daily in divided doses; proportionately less for children, depending on age, weight, and severity of infection.

†Literature and bibliography available on request.

\*Trademark

 **Science for the world's well-being**

**PFIZER LABORATORIES**, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.



# You and Your Business

## LIVE SURGERY TO BE TELEVIEWED TO PUBLIC DURING MCI

One of the important features of the 1959 Michigan Clinical Institute will be a public showing of "Cataract Extraction" beamed from Detroit's Providence Hospital to the public through the facilities of Station WWJ-TV, in the Motor City. D. H. Kaump, M.D., Detroit, is Medical Co-ordinator of the TV presentation.

A network of TV stations in the State will carry the show *live* to most TV viewers of Michigan: Station WOOD-T; WJIM-T; WNEM-T; WPBN-T.

This *live* telecast will be presented Monday evening, March 9, 1959. Co-operating with the Michigan Clinical Institute in this educational endeavor will be the Smith Kline & French Laboratories of Philadelphia whose new telecast facilities will be utilized.

All members of the Michigan State Medical Society are invited not only to view this live telecast but to invite their patients to do likewise, since such presentations enhance public appreciation of the efforts of the medical profession to bring to the people, through the use of modern medical-surgical methods, greater enjoyment of longer life.

## COMPONENT OFFICERS TO MEET

The Annual County Secretaries-Public Relations Seminar of the Michigan State Medical Society is scheduled for January 31-February 1, 1959, Sheraton-Cadillac Hotel, Detroit.

This informative session is held each year so that the officers and public relations committeemen of component societies may be furnished up-to-date information on activities of the Michigan State Medical Society.

This year's program includes a panel on "Progress Challenges Medicine" with the following participants: R. Wallace Teed, M.D., Ann Arbor; A. Hazen Price, M.D., Detroit; Arthur E. Schiller, M.D., Detroit, and Gaylord S. Bates, M.D., Dearborn.

A panel on "What the Michigan State Medical Society Has to Offer" will be moderated by Hugh M. Fuller, M.D., Detroit, with Ralph W. Shook, M.D., Kalamazoo, Gilbert B. Saltonstall, M.D., Charlevoix, and Wm. M. LeFevre, M.D., Muskegon, participating.

"Medicine and the Three Branches of Government" is the title of a symposium which will be moderated by Lawrence A. Drolett, M.D., Lansing. Illustrious representatives of the three divisions of government—executive, judicial and legislative—will appear on this program.

Lester P. Dodd, LL.B., Detroit, Legal Counsel of the Michigan State Medical Society, will present an entertaining talk with a serious message on "Ten Easy Lessons on How to Land in Court."

H. W. Brenneman of Lansing, MSMS Public Relations Counsel, will outline the opportunities of the medical man to talk about the amazing progress of medicine to the advantage of his patients and his profession; his presentation is entitled "Telling is Selling."

James E. Mahan, M.D., of Allegan, President of the County Medical Society Secretaries of Michigan, will be chairman of the meeting.

## ADVISORY COMMITTEE ON FEES

The Permanent Advisory Committee on Fees, a Committee of the MSMS House of Delegates, was created by that body in 1957 and served during the past year under the chairmanship of Grover C. Penberthy, M.D., Detroit.

At the 1958 House of Delegates session, the Speaker was authorized to augment this committee to nine members, to serve for staggered terms of three years.

The personnel of the Permanent Advisory Committee on Fees, as appointed by Speaker K. H. Johnson, M.D., of Lansing, is as follows:

G. C. Penberthy, M.D., <i>Chairman</i> .....(1959)	.....Detroit
L. J. Bailey, M.D.....(1961)	.....Detroit
H. F. Falls, M.D.....(1960)	.....Ann Arbor
H. W. Harris, M.D.....(1960)	.....Lansing
Wm. M. LeFevre, M.D.....(1960)	.....Muskegon
L. R. Leader, M.D.....(1961)	.....Detroit
M. L. Lichter, M.D.....(1959)	.....Melvindale
J. W. Rice, M.D.....(1961)	.....Jackson
Robert K. Whiteley, M.D.....(1959)	.....Detroit

## HEALTH PROGRAM FOR AGING

"Medicine's Blueprint for the New Era of Aging" is the title of an interesting and illuminating brochure, outlining a positive health program for older citizens, developed by an AMA Committee of which Frederick C. Swartz, M.D.,

(Continued on Page 30)



**ANNOUNCING**

**the first "wide range" antihypertensive**

**MILD MODERATE SEVERE**

**DIUPRES**

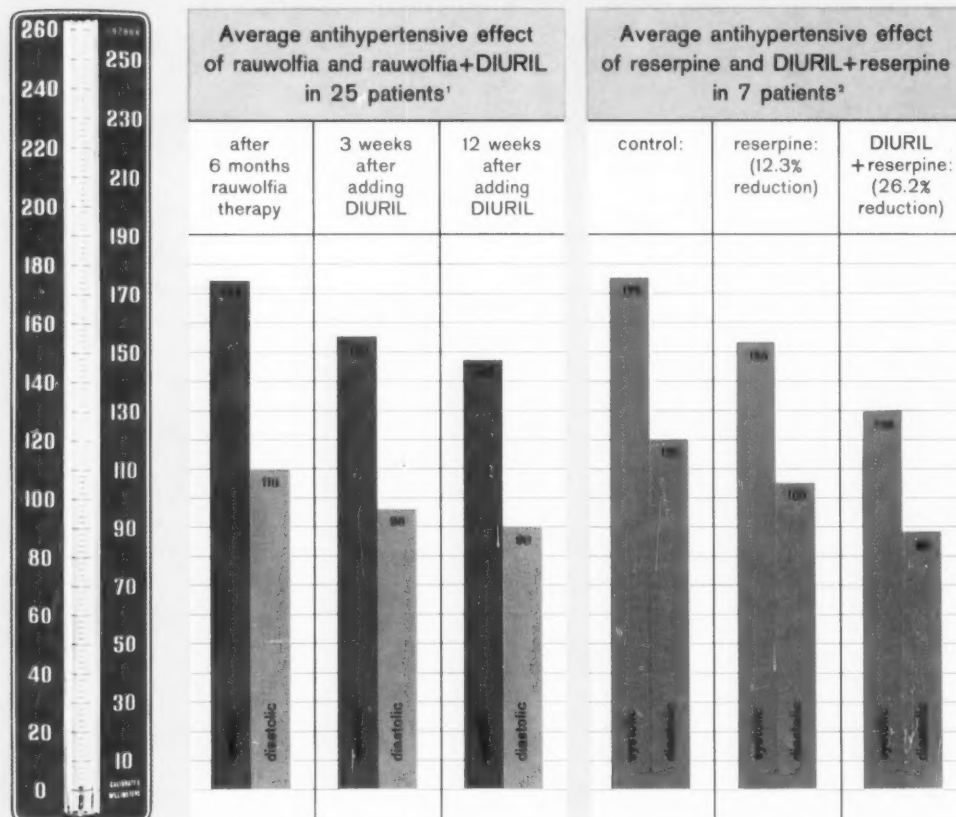
DIURIL<sup>®</sup> WITH RESERPINE

more hypertensives can be better controlled  
with **DIUPRES** than with any other agent  
... with greater simplicity and convenience

a logical alliance of two antihypertensives  
 you know and trust provides  
**increased effectiveness, decreased side effects**

### potentiated effect

DIUPRES produces an effect greater than either DIURIL or reserpine alone. It is effective in many patients who respond inadequately or not at all to either DIURIL or reserpine.



# DIUPRES

DIURIL<sup>®</sup> WITH RESERPINE

## effective therapy for most patients

DIUPRES by itself usually provides effective therapy for a majority of patients with mild or moderate hypertension, and even for many patients with severe hypertension. Many patients now treated with other agents which frequently cause distressing side effects can be adequately managed with well tolerated DIUPRES.

## provides basic therapy

Should other drugs need to be added to DIUPRES, they can be given in much lower than usual dosage so that their side effects are often strikingly reduced.

## rapid onset of effect

The antihypertensive action of DIUPRES is rapidly evident. (Considerable time may elapse before the antihypertensive effect of reserpine alone is observed.)

## fewer and less severe side effects

DIUPRES may be expected to cause fewer and less severe side effects than are encountered with other antihypertensive therapy. (Since DIURIL and reserpine potentiate each other, the required dosage of each is usually less when given together as DIUPRES than when given alone. Such reduction in dosage makes side effects less likely to occur.)

## often obviates weight gain

DIUPRES minimizes the problem of weight gain seen with reserpine (reserpine alone has been reported to produce weight gain in 50 per cent of patients).<sup>1,4</sup>

## virtually eliminates fluid retention

DIUPRES is not likely to cause either clinical or subclinical retention of sodium and water. (Hypotensive drugs, par-

ticularly rauwolfia<sup>5</sup> and hydralazine,<sup>6</sup> may cause fluid retention. Even when such retention is subclinical, their antihypertensive effectiveness is diminished.<sup>6</sup>)

## diet more palatable

With DIUPRES, there is less need for rigid restriction of dietary salt, which patients find so burdensome.

*"It may well be that the drug [DIURIL] produces the benefits of a markedly restricted low sodium diet but without its hardships."<sup>3</sup>*

## subjective and objective improvement

DIUPRES allays anxiety and tension, thus reducing the emotional component of hypertension. Organic changes of hypertension may be arrested and reversed. Headache, dizziness, palpitations and tachycardia are usually promptly relieved by DIUPRES. When the *anginal syndrome* accompanies hypertension, the administration of DIUPRES may also cause diminution or even disappearance of this syndrome concurrent with control of the hypertension.

## convenient, controlled dosage

Instead of two separate prescriptions, you write one prescription . . . the patient takes one tablet, rather than two different tablets . . . and the dosage schedule is easier for the patient to remember and follow.

*"patients have fewer lapses and make fewer mistakes in dosage, the simpler the regimen can be made. Therefore I do not hesitate to use more than one medicament combined in one tablet, provided this gives approximately the correct dosage of each."<sup>6</sup>*

## economical

DIUPRES will cost the patient less than if he were given two separate prescriptions for its components.

**Indications:**

DIUPRES is indicated in hypertension of all degrees of severity. It can be used in the following ways:

- as total therapy
- as primary therapy, adding other drugs if necessary
- as replacement or adjunctive therapy in patients now treated with other agents

**Precautions:**

The precautions normally observed with DIURIL or reserpine apply to DIUPRES. Additional information on DIUPRES is available to physicians on request.

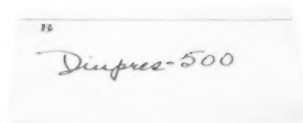
**Recommended dosage range:**

DIUPRES-500—one tablet one to three times a day.

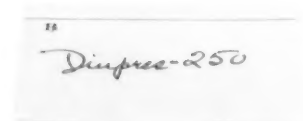
DIUPRES-250—one tablet one to four times a day.

If necessary, other agents may be added.

If the patient is receiving ganglion blocking agents or hydralazine, their dosage should be cut by 50 per cent when DIUPRES is added.

**DIUPRES-500**

500 mg. DIURIL (chlorothiazide), 0.125 mg. reserpine.  
Bottles of 100, 1000.

**DIUPRES-250**

250 mg. DIURIL (chlorothiazide), 0.125 mg. reserpine.  
Bottles of 100, 1000.

the first "wide range" antihypertensive

# DIUPRES

DIURIL<sup>®</sup> WITH RESERPINE

1. Rochelle, J. B., III, Bullock, A. C., and Ford, R. V.: Potentiation of antihypertensive therapy by use of chlorothiazide, *J.A.M.A.* 168:410, Sept. 27, 1958. 2. Freis, E. D., Wanko, A., Wilson, I. M., and Parrish, A. E.: Treatment of essential hypertension with chlorothiazide (Diuril), *J.A.M.A.* 166:137, Jan. 11, 1958. 3. Freis, E. D.: Treatment of hypertension. (Presented at the Annual Meeting of Southern Medical Association, Nov. 13, 1957.) 4. Moyer, J. H., Dennis, E., and Ford, R.: Drug therapy (Rauwolfia) of hypertension, *A.M.A. Arch. Int. Med.* 96:530, Oct. 1955. 5. Perera, G. A.: Edema and congestive failure related to administration of rauwolfia serpentina, *J.A.M.A.* 159:439, Oct. 1, 1955. 6. Wilkins, R. W.: Precautions in use of antihypertensive drugs, including chlorothiazide, *J.A.M.A.* 167:801, June 14, 1958.



MERCK SHARP & DOHME, DIVISION OF MERCK & CO., INC., PHILADELPHIA 1, PA.

\*DIUPRES and DIURIL (chlorothiazide) are trademarks of Merck & Co., Inc.



# for depression

## Deprol<sup>†</sup>

*Clinically confirmed*

*in over 2,500*

*documented*

*case histories<sup>1,2</sup>*

## CONFIRMED EFFICACY

- Deprol* ▶ acts promptly to control depression  
*without stimulation*
- ▶ restores natural sleep
  - ▶ reduces depressive rumination and crying

## DOCUMENTED SAFETY

*Deprol is unlike amine-oxidase inhibitors*

- ▶ does not adversely affect blood pressure or sexual function
- ▶ causes no excessive elation
- ▶ produces no liver toxicity
- ▶ does not interfere with other drug therapies

*Deprol is unlike central nervous stimulants*

- ▶ does not cause insomnia
- ▶ produces no amphetamine-like jitteriness
- ▶ does not depress appetite
- ▶ has no depression-producing aftereffects
- ▶ can be used freely in hypertension and in unstable personalities

**Dosage:** Usual starting dose is 1 tablet q.i.d. When necessary, this dose may be gradually increased up to 3 tablets q.i.d.

**Composition:** Each tablet contains 400 mg. meprobamate and 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl).

**Supplied:** Bottles of 50 scored tablets.

1. Alexander, L.: Chemotherapy of depression—Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. 2. Current personal communications; in the files of Wallace Laboratories.

†TRADE-MARK  
CO-748D

*Literature and samples on request*  WALLACE LABORATORIES, New Brunswick, N. J.

## HEALTH PROGRAM FOR AGING

(Continued from Page 28)

Lansing, Michigan, is chairman. The brochure includes a six-point program proposed as a basis for action by medicine in the field of aging. While primarily designed as a challenge to medical societies at national, state and local levels, the booklet is one that should be in the hands—and be well read—by every member of the American medical profession.

Efforts in the following six categories are urged:

1. Stimulation of a realistic attitude toward aging by all people.
2. Extension of effective methods of financing health care for the aged.
3. Expansion of skilled-personnel training programs and improvement of medical and related facilities for older people.
4. Promotion of health maintenance programs and wider use of restorative and rehabilitative services.
5. Amplification of medical and socio-economic research in problems of the aging.
6. Leadership and co-operation in community programs for senior citizens.

Congratulations, Doctor Swartz and your committee, on developing this important pattern in better health for the aging!

## MEDICAL OFFICIALS URGE CUT RATES FOR AGED

Undoubtedly, the most important single official action of the American Medical Association House of Delegates for many years was accomplished December 4, 1958, as reported on our editorial page in this issue. The news broke in earlier papers, the reporters forgetting that the much discussed resolution was not official until the House had voted.

\* \* \*

High American Medical Association (AMA) officials recommended here Wednesday that the nation's doctors agree to care for the low-income aged at reduced rates if they have health insurance.

This should be done so special low-premium health insurance can be developed on a large scale for Americans over sixty-five, said the AMA's council on medical service.

Its recommendation, it said, "has been studied and restudied by the board of trustees and received its wholehearted endorsement."

The trustees are the AMA's top policy body, headed by Dr. Leonard W. Larson, Bismarck, N. D.

"What we propose," explained Dr. Robert L. Novy, Detroit, Michigan, member of the medical service council, "is that we handle the low-income aged just as the doctor has traditionally handled those whose worldly goods are less.

"We would propose, for example, a graduated fee schedule for insured persons over 65, with a

lower fee if the income was, say under \$2,500 a year.

"This is only an example. We are suggesting no income figure now."

Novy and Dr. J. D. McCarthy, Omaha, Neb., council chairman, said they "definitely" fear federal health insurance or other plans for the aged unless independent plans like Blue Cross and Blue Shield are quickly and drastically expanded.

Morris Hursh, Minnesota welfare commissioner, in recent weeks has called repeatedly for a federal health insurance program to cut state medical costs for the aged.

Blue Cross and Blue Shield plans already cover many people over sixty-five. In Minnesota, for example, you can keep Blue Cross or Blue Shield coverage if you started it before you were sixty-five.

"We consider this a strong moral statement that we recognize the need and are willing to accept the responsibility," Novy said.—*Minneapolis Morning Tribune*, December 4, 1958.

EDITOR'S NOTE: We have reported a very few items from the newspapers in Minneapolis. The American Medical Association act was so unexpected, so unanimous, and so far-reaching, we are also reporting an editorial comment from a local newspaper, and the first steps from Blue Shield to inaugurate the program. Planners have been studying this aging problem for years. Michigan's Blue Shield and Blue Cross have paid enormous amounts for care of major problems. Michigan Plans never cancel a contract for age, and never have.

This is quite true generally. Most of the Plans (thirty-one) accept individual, non-group subscribers up to age sixty-five. One Plan requires entry before age forty-nine and terminates at age seventy. In one Plan, the subscribers age limit is sixty-six, in five it is sixty, and in one, sixty-one. Twenty-nine Plans have no age limit listed.

## MEDICAL AID FOR THE AGED

Everyone realizes that as a nation we are growing old—and that the problems of the aged are growing at an even faster rate.

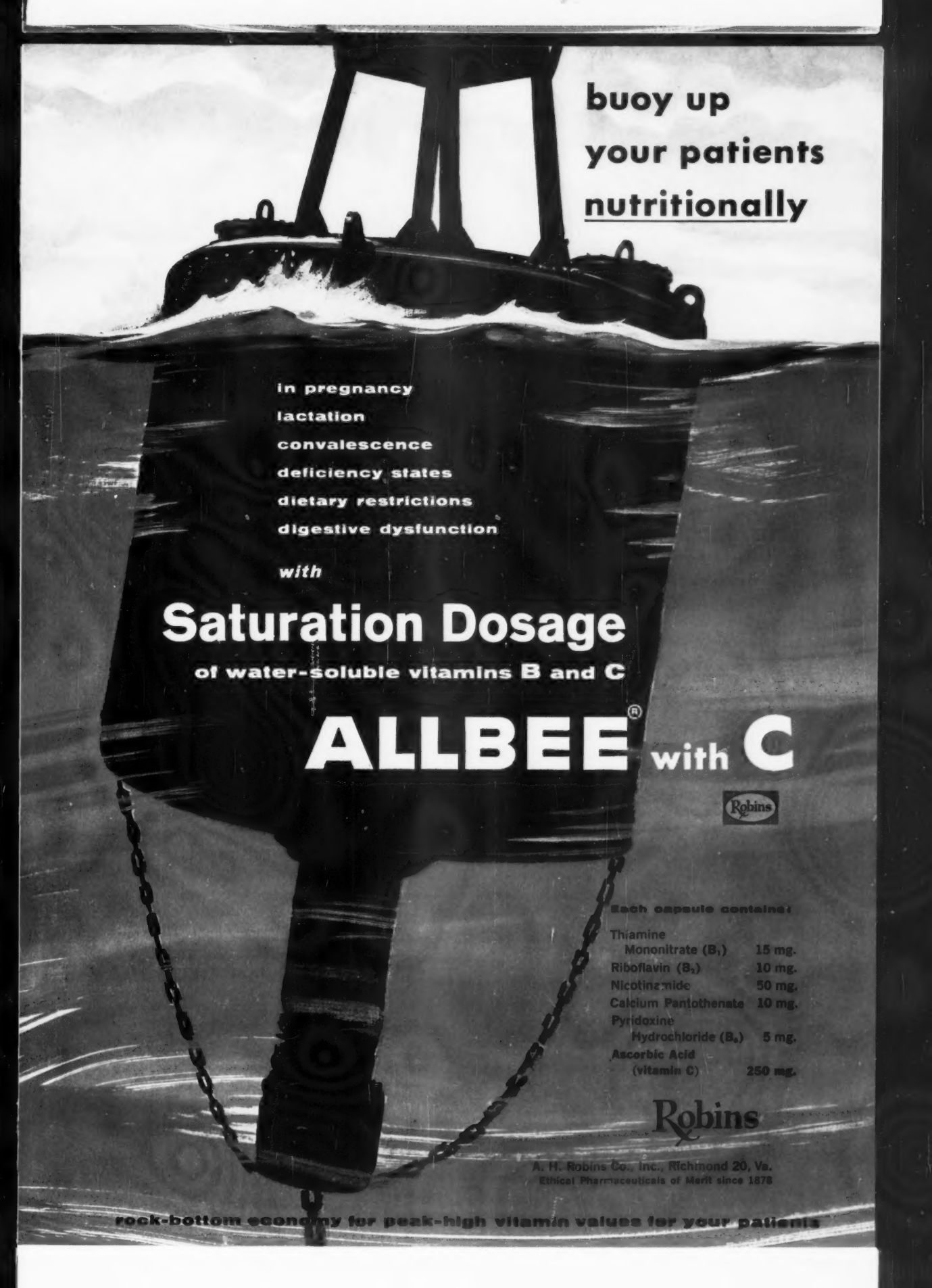
Census figures which reveal that the ratio of those over sixty-five to the whole population doubled between 1900 and 1950 only hint at the problem, for now that we are living longer, the number of oldsters is increasing every year.

The problems of food, clothing, housing and simple social needs of these older persons are formidable enough in themselves, but the fact that an oldster requires an increased amount of medical attention as he ages put the spotlight on this aspect.

A recent Health Information Foundation survey shows expenditures for all personal health services to average \$65 a year per person for the entire population, but \$102 a year for men and women sixty-five or more.

Yet in the face of this increased need for medical aid in the sunset years, surveys show that termina-

(Continued on Page 37)



**buoy up  
your patients  
nutritionally**

**in pregnancy  
lactation  
convalescence  
deficiency states  
dietary restrictions  
digestive dysfunction**

*with*

## **Saturation Dosage**

**of water-soluble vitamins B and C**

# **ALLBEE<sup>®</sup> with C**



**Each capsule contains:**

Thiamine Mononitrate (B <sub>1</sub> )	15 mg.
Riboflavin (B <sub>2</sub> )	10 mg.
Nicotinamide	50 mg.
Calcium Pantothenate	10 mg.
Pyridoxine Hydrochloride (B <sub>6</sub> )	5 mg.
Ascorbic Acid (vitamin C)	250 mg.

**Robins**

A. H. Robins Co., Inc., Richmond 20, Va.  
Ethical Pharmaceuticals of Merit since 1878

**rock-bottom economy for peak-high vitamin values for your patients**

# Exactly how does new Halodrin\* restore the “premenopausal prime” in postmenopausal women?

Webster defines “prime” as the period of greatest health, strength, and beauty. In a woman, these are the childbearing years between puberty and menopause—the years when her hormone production is highest.

The inevitable reduction in this hormone production as she enters the menopause often results in physical discomfort in the form of hot flushes, nervousness, insomnia, or a multiplicity of other symptoms with which you are familiar. Superimposed on this physical picture is the psychic trauma brought on by this unavoidable evidence of aging. The thing that brings her to a physician is simply that she “feels bad.”

You can't make her 35 again—but the odds are good that you can make her feel like it! The secret is a combination of reassurance and hormones. The exact form and amount of the former defy objective analysis, but the latter can now be provided with scientific precision. Reduced to essentials, here is the explanation of exactly how hormones—in the form of Upjohn's new Halodrin—restore the “premenopausal prime.”

The normal premenopausal woman excretes estrogens in the urine in the form of estradiol, estrone, and estriol, in an approximate 28-day average ratio of 39:15:46. Starting with this urinary excretion of estrogens, it is possible to calculate backwards and estimate the amount of estradiol that must have been secreted endogenously in order to produce these urinary levels. This is possible because the proportion of estrogens which appears in the urine following parenteral administration has been established in castrated women.

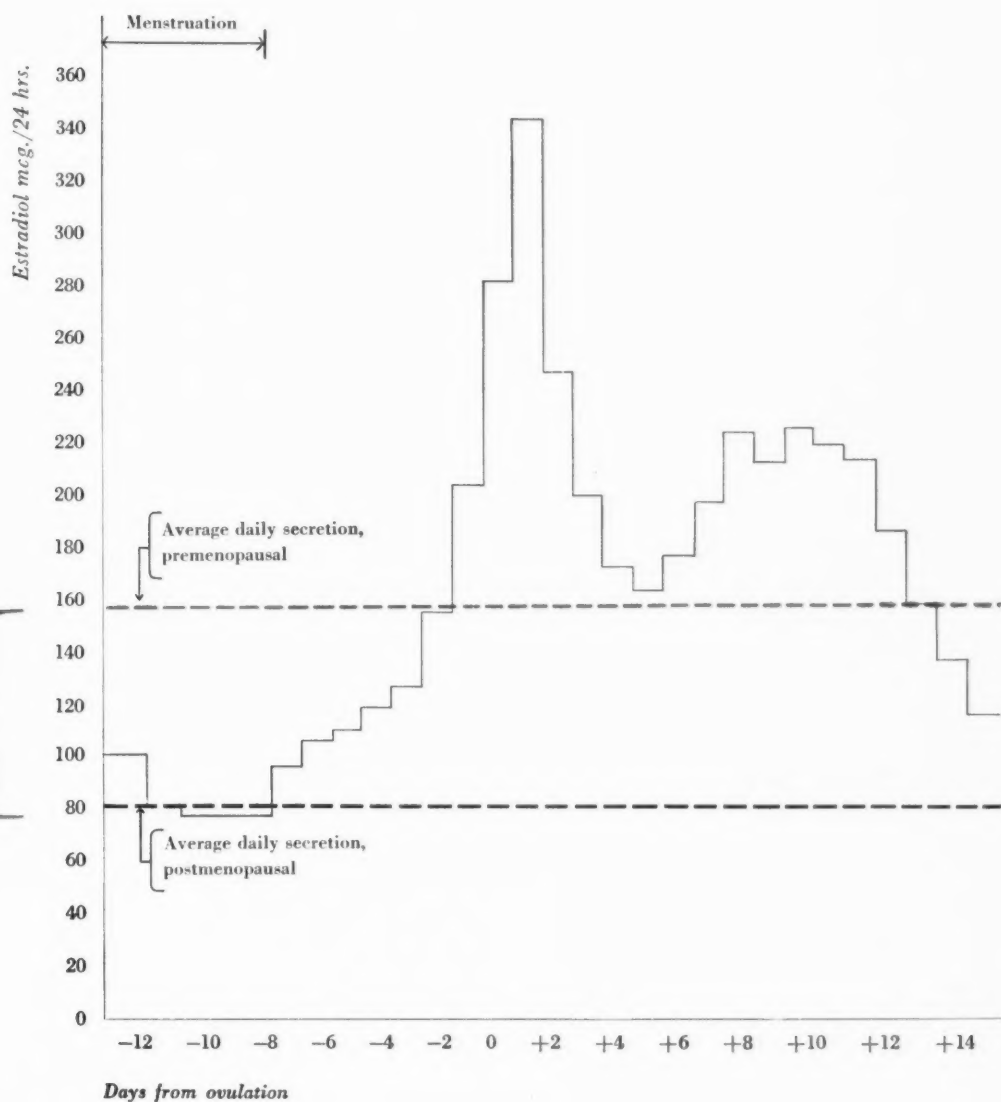
On this basis, the average endogenous output of estrogens is about 160 micrograms per day during a menstrual cycle, and 80 micrograms per day in postmenopausal women (see chart opposite). Therefore, the restoration of the “premenopausal prime” in the postmenopausal woman requires the replacement of approximately the equivalent of the 80 micrograms of estradiol per day that she no longer secretes endogenously.

Oral ethinyl estradiol is about 2 to 2½ times as potent as parenteral estradiol. Therefore, the replacement of 80 micrograms of endogenous estradiol production per day is accomplished by the oral administration of 32 to 40 micrograms of ethinyl estradiol per day.

Each Halodrin tablet contains 20 micrograms of ethinyl estradiol, which means that the recommended dosage of 2 tablets per day provides 40 micrograms of ethinyl estradiol. This offsets the loss of 80 micrograms of endogenous estradiol production in the menopausal woman; i.e., restores the “premenopausal prime.”

Each Halodrin tablet also contains 1 mg. of Upjohn-developed Halotestin\* (fluoxymesterone)—the most potent oral androgen known. The primary purpose is to “buffer” the ethinyl estradiol just enough to prevent breakthrough bleeding, which is obviously undesirable in the menopause. It also exerts other beneficial hormonal effects, one of which, in common with ethinyl estradiol, is a powerful anabolic action so desirable in patients of advanced years.

**Endogenous estrogen secretion (mcg./24 hours)**  
 (calculated from average 24-hour urinary excretion  
 of estradiol, estrone, and estriol)





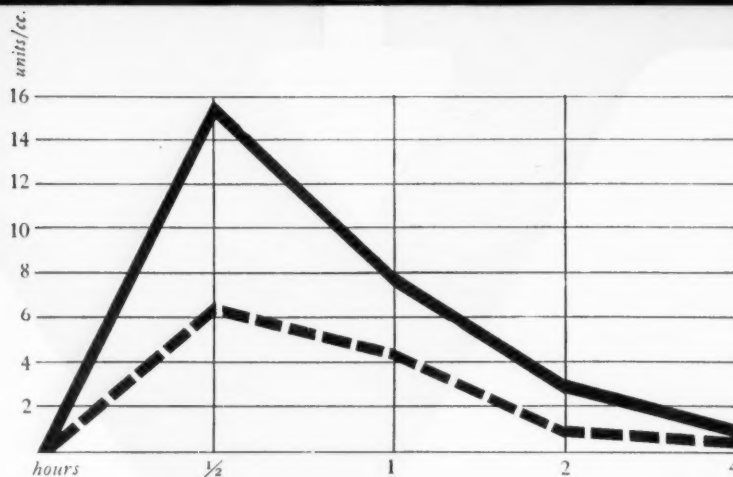
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- The highest levels of Filmtab Com-pocillin-VK.
- - - The median levels of Filmtab Com-pocillin-VK.

Note the high upper levels and averages at  $\frac{1}{2}$  hour, and at 1 hour.

Doses of 400,000 units were administered before mealtime to 40 subjects involved in this study.



the higher  
blood levels of  
potassium  
penicillin V

# illin<sup>®</sup>-VK

IN FILMTAB,  
COMPOCILLIN-VK comes in  
125 mg. (200,000 units),  
bottles of 50 and 100, and  
in 250 mg. (400,000 units),  
bottles of 25 and 100.

FOR ORAL SOLUTION,  
COMPOCILLIN-VK comes in  
dry granules for easy recon-  
stitution with water. Cherry  
flavored, the granules are in  
40-cc. and 80-cc. bottles. Each  
5-cc. teaspoonful represents  
125 mg. (200,000 units) of  
potassium penicillin V.

IN FILMTAB<sup>®</sup>/ IN ORAL SOLUTION

Abbott

# BONADOXIN®

(tablets and drops)

**STOPS  
STOPS  
STOPS  
MORNING  
SICKNESS**

BONADOXIN Tablets relieve nausea and vomiting of pregnancy in 9 out of 10, 1-7 often within a few hours.

Moreover, a controlled study of 620 cases reported that with BONADOXIN "toxicity and intolerance (are) zero!" BONADOXIN is rarely soporific. It is free from the risks associated with overpotent tranquilizer-anti-nauseants.

NOTE: BONADOXIN has also been shown highly effective in relieving nausea and vomiting associated with anesthesia, radiation sickness, labyrinthitis, cerebral arteriosclerosis, and motion sickness.

Each tiny pink-and-blue BONADOXIN tablet contains:

Meclizine HCl (25 mg.) . . . for anti-vertiginous, anti-nauseant effects.

Pyridoxine HCl (50 mg.) . . . for specific metabolic replacement.

DOSAGE: usually one tablet at bedtime. Severe cases may require another dose on arising.

SUPPLIED: tiny pink-and-blue tablets, bottles of 25 and 100. Fruit-flavored, clear green syrup in 30 cc. dropper bottles.



Infant colic? BONADOXIN DROPS are antispasmodic...stop colic in 84% 8-10 without the risk of belladonna and biliturates.

Each cc. contains:  
Meclizine dihydrochloride . . . 8.33 mg.  
Pyridoxine hydrochloride . . . 16.67 mg.

#### Dosage:

under 6 months . . . . . 0.5 cc.

6 months to 2 years . . . . . 1.5 to 2 cc.

2 to 6 years . . . . . 3 cc.

adults and children over 6 . . . . . 1 tsp. (5 cc.)

2 or 3 times daily, on the tongue, in fruit juice or water

References: 1. Goldsmith, J. W.: Minnesota Med. 40:99 (Feb.) 1957. 2. Groskloss, H. H., et al.: Clin. Med. 2:285 (Sept.) 1955. 3. Cramer, J. W.: J. Am. Med. Ass. 166:100 (Feb.) 1955. 4. Practice Digest Treat. 1580 (April) 1955. 5. Crawley, C. R.: West. J. Surg. 8:463 (Aug.) 1956. 6. Tartikoff, G.: Clin. Med. 3:223 (March) 1955. 7. Dunn, R. D., and Fox, L. P.: Clinical exhibit. 7. Codine, J. W., and Lowden, R. J.: Northwest Med. 57:331 (March) 1958. 8. Douglas, H. T.: Personal communication. 9. Leonard, C. L.: Personal communication. 10. Steinberg, C. L.: Personal communication.



New York 17, N. Y.  
Division, Chas. Pfizer & Co., Inc.  
Science for the World's Well-Being

## MEDICAL AID FOR THE AGING

(Continued from Page 30)

tion and cancellation of personal health insurance upon leaving employment at sixty-five has greatly curtailed the ability of oldsters to pay for such care. A survey by the Health Information Foundation made five years ago disclosed that medical insurance in some form covered over 60 per cent of the whole population, but only 30 per cent over sixty-five. Another survey, made this year by the Health Insurance Institute, covering the population of New York State, indicated that 65 per cent of the population sixty-five years and over has no health insurance.

These figures help to explain why government at all levels is now assuming financial responsibility for more than two-thirds of the care given the aged in hospitals and more than one-half of the care supplied in mental institutions. The figures help to explain, also, the trend toward socialized medicine which would mean less medical service at higher cost to tomorrow's taxpayer.

The American Medical Association House of Delegates last week accepted a resolution asking doctors to make less than normal charges for treating elderly persons with low incomes and small savings. If honored by doctors generally, the resolution, recommended by the Association's Board of Trustees and Council on Medical Service, would mean that low-income elderly persons could get health insurance at lower premiums than at present.

Most persons realize that few persons are so generous as our doctors when confronted with cases of need. However, by officially endorsing establishing this practice, it may become possible to get the needed health insurance for the elderly.

We all know that this is a field in which the government eventually will act if the doctors won't. However, if hospital costs and health insurance charges keep soaring at a rate far out of proportion to other mounting costs in our economy, no amount of fee bloodletting by the doctors will be able to keep the pace. Excessive charges pave the way for socialized medicine, whether or not those charges stem from administrative ineptness.—Editorial *Bay City Enquirer-News*, December 8, 1958.

COMMUNICATION FROM  
BLUE SHIELD COMMISSION

December 8, 1958

The resolution passed by the December 4, 1958 session of the House of Delegates of the American Medical Association was the subject of our December 5 news release. This represents a most significant and forceful act on the part of organized medicine and is particularly effective and

meaningful as a rebuttal to legislation of the Forand type which will almost certainly be introduced in this next session of Congress.

The program, as described by the resolution, envisions a service contract designed especially for people over sixty-five, with fee schedules and subscriber rates scaled to a low income level.

Appropriate committees and the staff of Blue Shield Medical Care Plans are already at work collecting and evaluating all available data to produce a pattern of coverage, fees, and rates which can be used by Plans in developing a program for senior citizens. It is the feeling of all concerned that the closer Plans can come to a uniform offering, the more successful will be our efforts.

You are urged, therefore, to await further word from this office before taking any specific action to implement the intent of this resolution.

## INDUSTRIAL MEDICINE

More than fifty medical directors representing some of the largest corporations in the United States and Canada met at The University of Michigan Medical Center, Friday and Saturday, Dec. 5 and 6, 1958, to discuss current health problems of the nations' working force.

Titled the "Selby Discussion" in honor of the former medical director of the General Motors Corporation, the annual event is now in its tenth year. It is conducted by the University of Michigan Institute of Industrial Health.

The opening day's session is closed to all but invited guests and is designed to give the participants opportunity for a "no-holds-barred" discussion of problems in industrial medicine.

On Saturday three specialists from the University of Michigan Medical School reviewed modern developments in their respective fields and pointed out the applications to industry.

John F. Holt, M.D., professor of radiology: x-ray diagnosis of bone disease; H. Marvin Pollard, M.D., professor of internal medicine; gastric ulcers; and Walter M. Whitehouse, M.D., associate professor of radiology: x-ray diagnosis of chest diseases.

Host for the program is Seward E. Miller, M.D., chairman of the Department of Industrial Health, in the University of Michigan School of Public Health.

Those attending from Michigan were: *Dearborn*—Duane L. Block, M.D., Ford Motor Company; Earle A. Irvin, M.D., Ford Motor Company; *Detroit*—Marion Jocz, M.D., Chrysler Corporation; Earl F. Lutz, M.D., General Motors Corporation; Arthur J. Vorwald, Wayne State University; *Kalamazoo*—Wilfred N. Sisk, M.D., The Upjohn Company; *Midland*—Harold H. Gay, M.D., The Dow Chemical Company; *Wyandotte*—Joseph T. Noe, M.D., Wyandotte Chemicals Corporation.



CHRYSLER CORPORATION DOCTORS

### CHRYSLER CORPORATION DOCTORS

All Chrysler Corporation doctors attended an industrial health seminar at the corporation's headquarters in Detroit on October 17 and 18. It was the first national meeting held by the company's medical department.

Ways and means of further improving the on-the-job health and medical safeguards for the company's 95,000 employees was the principal topic for the meeting. Front row (*left to right*) are Dr. James Rogin, consultant at Chrysler Corporation's central medical department; Dr. Emerson Evison, Outer Drive plant; Miss Crystal Halstead, superintendent of nurses; Dr. Raymond Laige, group medical director; Dr. Marion Jocz, medical director; Dr. Martin Bruton, assistant medical director; Dr. Louis Staudt, chief of the consulting services section; Dr. John Glees, group medical director and Dr. John Montgomery, Dodge Truck plant. Second row (*left to right*) are Dr. Irene Suen, Mack Avenue plant; Don Fowler, chief of industrial hygiene section; Dr. P. Grant Crozier, Canadian plants; Dr. John MacLennan, medical director for Chrysler of Canada; Dr. Lullus Muller, Electrical Equipment Division, Indianapolis, Indiana; Dr. Karl Klokke, Jefferson Assembly plant; Dr. Robert James, Los Angeles, California, Assembly plant; Dr. William Shields, central medical department; Dr. Harry Mauthe, Trenton Engine plant; Dr. Frank Hendricks, Dodge Assembly plant; Dr. Armen Shekerjian, Lynch Road Gear & Axle plant; Dr. William Stowe, Airtemp plant, Dayton, Ohio; Dr. Walter Glazer, MoPar plant; Dr. Edgar Mendians, Plymouth Assembly plant; Dr. John Engel, Missile Division; Dr. Edward Svec, Ohio Stamping plant, Twinsburg, Ohio; Dr. William Hutto, Kokomo, Indiana, Transmission plant; Dr. Alfred Kramer, New Process Gear Division, Syracuse, N. Y.; Dr. Joseph Carlisle, Imperial Assembly plant; Dr. Melvin Durkee, Evansville, Indiana, Plymouth plants; Robert Rosenbusch, business manager—

medical department. Four doctors unable to attend the seminar are: Dr. Henry Wass, Marysville plant; Dr. Howard Stayton, Newark, Delaware, Assembly plant; Dr. Ray Foster, New Castle, Indiana, plants, and Dr. Burns Newby, consultant at central medical department.

All plants are in the Detroit area unless otherwise specified.

### GERM-FREE LABORATORY

A new and simplified germ-free laboratory, believed to be virus-proof as well, has been successfully tested at The University of Michigan Medical Center.

A goal of biological scientists since the turn of the century, the apparatus is an outgrowth of two other systems developed in the United States and Sweden.

Guinea pigs born in the sterile laboratory last September have survived. The achievement recalled stormy debates that raged early this century on the proposition that all animal life depends, for its very existence, on certain "beneficial bacteria" prevalent in normal life.

The germ-free apparatus, a sealed metal and glass box about the size of a deep-freeze cabinet, is expected to become a tool for extensive medical research on the role of organisms in the life of men and animals.

Nothing rots inside the miniature laboratory. Excess food and animal feces have remained for weeks without decomposing and without odor.

The test was conducted by Dr. Gerald D. Abrams, instructor in pathology at the University of Michigan Medical School.

He delivered the guinea pigs by Caesarean section directly into the germ-free cabinet, employing an intricate surgical procedure that used

(Continued on Page 40)



*in peptic ulcer*

REFRACTORY  
CASES  
RESPOND TO

NEW

## DARICON\* tablets

OXYPHENCYCLIMINE HYDROCHLORIDE

### POTENT ANTICHOLINERGIC ACTION

curbs secretion when excessive  
normalizes motility when overactive

*Activity appears to be restricted to the desired site of action.  
Predictable therapeutic response in refractory cases.*

Potency and Prolonged Duration of Action  
10 mg. b.i.d. Average Dose • Supplied as:  
10 mg. white, scored tablets

References: 1. Finkelstein, Murray: Journal of  
Pharmacology and Experimental Therapeutics, in  
press. 2. Winkelstein, Asher: Paper in preparation.

\*Trademark

**Pfizer** Science for the world's well-being

**PFIZER LABORATORIES**  
Division, Chas. Pfizer & Co., Inc.,  
Brooklyn 6, N. Y.



**GERM-FREE LABORATORY***(Continued from Page 38)*

a plastic membrane to prevent possible contamination by the mother's body.

Guinea pigs were chosen for the work because the young are able to fend for themselves upon birth and do not have to be nursed.

Work thus far has concentrated on testing the apparatus. In the near future, researchers will begin to compare the body tissues of ordinary animals and those raised in the germ-free environment.

**BIGGER 1959 SAMA SCIENTIFIC ASSEMBLY PLANNED**

Medical students, interns and residents are being urged to participate in the second annual national Scientific Exhibit Assembly of the Student American Medical Association to be held in Chicago April 30-May 2, 1959.

The program was inaugurated in 1958 and is dedicated both to the contributions of medical students to research and to the advancement of the scientific exhibit as a primary medium of communication in the profession. It is hoped that new physicians will contribute to their colleagues' knowledge through exhibits and papers throughout their medical careers.

Arrangements have been made for more space to hold a total of 40 scientific exhibits, the best work presented in this medium of professional

communication by the country's outstanding students, interns and residents. Of these, twenty will be by students and twenty by interns and residents.

The SAMA-Lakeside Laboratories Awards will again be given, with the special honor of free all-expense trips to the American Medical Association convention and the privilege of exhibiting in the AMA's own world-famed scientific assembly, for the top student and the top intern or resident.

Cash prizes and plaques will be given, with \$500, \$250 and \$100 for award-winning exhibits by students; and \$500, \$250 and \$100 for those by interns and residents. Lakeside Laboratories supports the awards and the trips to the AMA.

A distinguished group of judges will again make the decisions.

SAMA believes this program is a real opportunity for all medical colleges and teaching hospitals—students, faculty and hospital staff alike—to report on their work nationally and to be recognized for their contributions to new medical knowledge.

*Applications must be obtained from SAMA (address Mr. Russell Staudacher, Executive Secretary, Student American Medical Association, 430 North Michigan Avenue, Chicago 11, Illinois) and returned no later than February 1, 1959. On February 14, the forty chosen exhibitors will be announced. These must complete their exhibits and ship them to Chicago at their own expense, for inclusion in the SAMA scientific assembly, April 30-May 2.*

*(Continued on Page 42)*

The new \$8,500,000 facilities of the University of Michigan Medical School and School of Nursing will be dedicated in official ceremonies, February 22, 1959.

Invitations to the affair are limited to 250 persons, and will be sent to medical, academic, legislative and community leaders.

Coinciding with the dedication, the University will hold a public "open house" of the new teaching facilities, with medical and nursing students acting as escorts for the visitors.

The tour will include visits to the departments of Pathology, Biochemistry and Pharmacology and to the School of Nursing. Special exhibits of teaching materials, laboratory equipment and classrooms are being arranged for the visitors.

A. C. Furstenberg, M.D., Dean of the University of Michigan Medical School, expects up to 3,000 visitors may attend the Sunday afternoon "open house," depending on the weather.

Your difficult rheumatic patient...

*on the job again*

through effective relief and rehabilitation

For the patient who does not require steroids

**PABALATE®**

Reciprocally acting nonsteroid antirheumatics... more effective than salicylate alone.

In each enteric-coated tablet:

Sodium salicylate U.S.P. .... 0.3 Gm. (5 gr.)  
Sodium  
para-aminobenzoate ..... 0.3 Gm. (5 gr.)  
Ascorbic acid ..... 50.0 mg.

or for the patient  
who should avoid sodium

**PABALATE® - Sodium Free**

Pabalate, with sodium salts replaced by potassium salts.

In each enteric-coated tablet:

Potassium salicylate ..... 0.3 Gm. (5 gr.)  
Potassium  
para-aminobenzoate ..... 0.3 Gm. (5 gr.)  
Ascorbic acid ..... 50.0 mg.

For the patient  
who requires steroids

**PABALATE®-HC**

(PABALATE WITH HYDROCORTISONE)

Comprehensive synergistic combination of steroid and nonsteroid antirheumatics... full hormone effects on low hormone dosage... satisfactory remission of rheumatic symptoms in 85% of patients tested.

In each enteric-coated tablet:

Hydrocortisone (alcohol) ..... 2.5 mg.  
Potassium salicylate ..... 0.3 Gm.  
Potassium para-aminobenzoate.. 0.3 Gm.  
Ascorbic acid ..... 50.0 mg.

**PABALATE®**  **PABALATE®-HC**

For steroid or non-steroid therapy: **SAFE DEPENDABLE ECONOMICAL**

**A. H. ROBINS CO., INC., RICHMOND 20, VIRGINIA • Ethical Pharmaceuticals of Merit since 1878**

## BIGGER 1959 SAMA SCIENTIFIC ASSEMBLY PLANNED

(Continued from Page 40)

Space and basic materials such as backdrop, table, chairs and lighting, will be provided free by SAMA.

Last year, SAMA was particularly pleased that the top award-winning exhibit by a student, Quinton Callies of Wisconsin, was also exhibited at the American Trudeau Society, as well as at SAMA and AMA, and the study was published in the *Journal of the A.M.A.*

## HIGHLIGHTS OF THE EXECUTIVE COMMITTEE OF THE COUNCIL

### Meeting of November 19, 1958

At the meeting of November 19 held in the University of Michigan Hospital, members of the Executive Committee of The Council were guests of Medical School officials including Dean A. C. Furstenberg, M.D., Harold F. Falls, M.D., A. C. Kerlikowske, M.D., Roger B. Nelson, M.D., John M. Sheldon, M.D., Harry A. Towsley, M.D.

Seventy-seven items were presented at this long session which began at 10:00 a.m. and ended at 6:20 p.m. Chief in importance were:

- **Follow-through on twenty-two actions** of the 1958 MSMS House of Delegates included: (A) instruction to each Councilor to hold quarterly meetings with his Delegates to inform them on progress made "by the mechanism set-up and in operation for the instrumentation of the Blue Shield program," so that the Delegates in each district may go back to their constituent county societies and explain to the membership what has happened in the preceding quarter; (B) that reprints of the Annual Reports of the Medical Care Insurance Committee be sent to the President and Secretary of every County Medical Society et al and that lantern slides be made available; (C) distribution of polio vaccine to medical indigent—letters were authorized to be sent to the Governor and to appropriate budget committees of the legislature outlining the MSMS position.
- **Medical Section Officers:** G. Thomas McKean, M.D., and J. J. Lightbody, M.D., Detroit, were appointed Chairman and Secretary, respectfully, of the Section on Medicine, which Section had not elected officers at its meeting held during the 1958 Annual Session.
- **Three matters** were presented by the University of Michigan Medical School representatives:
  1. Registration of the patient.
  2. Answering the referral letter.
  3. Questions and answers.
- **MSMS Group Life Insurance Program.**—Approval for the MSMS group life plan has been given by the State Insurance Commissioner, as reported by M. A. Darling, M.D., Chairman of the MSMS Committee which developed this program. A brochure to explain the program was authorized for mailing to members.
- **Council Committees** for the year 1958-59 were appointed by Council Chairman D. Bruce Wiley, M.D.  
The Council Chairman was authorized to appoint a Committee to study feasibility of greater participation (such as with oral surgeons, chiropodists, etc.) in Blue Shield, this MSMS Committee to work with a similar committee of Michigan Medical Service.
- **The House of Delegates' Permanent Advisory Committee on Fees** was appointed by Speaker K. H. Johnson, M.D. (See "You and Your Business").
- **M. A. Darling, M.D., and G. Thomas McKean, M.D.,** were chosen as co-chairmen of the Testimonial Luncheon of Thursday, March 12, 1959, to be held during the Michigan Clinical Institute. The Press Committee for the MCI was chosen: A. B. Gwinn, M.D., Hastings, Chairman; S. E. Chapin, M.D., Dearborn; H. F. Dibble, M.D., Detroit; J. J. Lightbody, M.D., Detroit; Ralph W. Shook, M.D., Kalamazoo; C. L. Weston, M.D., Owosso; John M. Wood, M.D., Mount Pleasant.
- A proposed program for the 1959 Annual County Secretaries-Public Relations Seminar of January 31, February 1 was presented and approved.
- **Uniform Fee Schedule for Governmental Agencies.**—The Executive Committee of The Council decided this Fee Schedule shall be based upon the existing Michigan Relative Value Scale and those unit values applicable to the \$2500 (Plan A) M-75 contract as previously approved by The Council. This action of the Executive Committee of The Council was referred to the House of Delegates' Permanent Advisory Committees on Fees, in accordance with House of Delegates instructions.
- **D. J. Sandweiss, M.D.,** Detroit, was appointed to the Committee on Postgraduate Medical Education and W. C. Lambert, M.D., of Marquette to the Maternal Health Committee by President Gilbert B. Saltonstall, M.D.
- **Two committee reports** were presented: Medical Care Insurance Committee, meeting of October 29, and meeting of Chairmen of Councilor

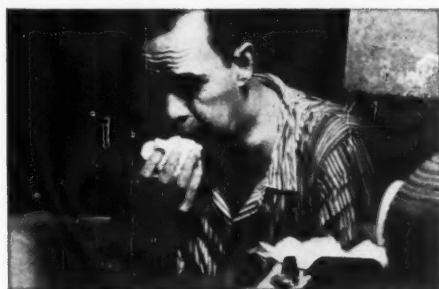
(Continued on Page 44)

# Pyribenzamine® EXPECTORANT breaks up cough

**even persistent cough**



Patient, factory worker, age 43, had suffered for months with persistent, dry cough, which he termed "smoker's hack."



Cough frequently interrupted his sleep, causing him to be nervous, irritable; his job efficiency was impaired.



Chest X-ray was negative and the plant physician prescribed PYRIBENZAMINE EXPECTORANT with Ephedrine. Patient noticed almost immediate relief—a week later felt "considerably better."

Pyribenzamine Expectorant with Ephedrine provides a unique combination of antitussive agents, which work three ways at once to break up the persistent cough: *Pyribenzamine* relieves histamine-induced congestion throughout the respiratory tract; *ephedrine* relaxes the bronchioles and makes breathing easier; *ammonium chloride* liquefies mucus, relieving dry cough and promoting productive expectoration.

**Supplied:** Pyribenzamine Expectorant with Ephedrine, containing 30 mg. Pyribenzamine citrate (equivalent to 20 mg. Pyribenzamine hydrochloride), 10 mg. ephedrine sulfate and 80 mg. ammonium chloride per 4-ml. teaspoon. Also available: Pyribenzamine Expectorant with Codeine and Ephedrine, same formula as above with the addition of 8 mg. codeine phosphate per 4-ml. teaspoon (exempt narcotic).

Pyribenzamine® citrate (tripelennamine citrate CIBA)

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SUMMIT, N. J.



## HIGHLIGHTS OF THE COUNCIL

(Continued from Page 42)

District Medical Care Insurance Committees, October 29.

- **Discussion of matters of mutual interest** with Michigan Health Commissioner A. E. Heustis, M.D., included report on Regional Staphylococcus Conference held in Chicago; on the poliomyelitis problem; and on the State Health Department budget for next year.
- **Public Relations Counsel's Report:** Michigan Association of the Professions—W. M. LeFevre, M.D., of Muskegon and G. B. Saltonstall, M.D., of Charlevoix were the official MSMS Delegates to MAP.
- **A survey of The Journal MSMS**, for the purpose of making recommendations for advisable changes in format, in order to increase, if possible, the magazine's readability and communications value, was authorized.
- **A vote of high thanks** was extended to the University of Michigan Medical School officials for their hospitality to the members of The Council on this occasion.



Transferring the MSMS badge of office, retiring President George W. Slagle, M.D., makes final adjustment of the ribbon and gives custody of the President's Medal to G. B. Saltonstall, M.D., incoming President, at the Officers Night Dinner Dance during the 1958 Annual Session in Detroit.



With obvious gratification, some of the newly elected officials of MSMS gather for a round of hand-shaking with retiring President Slagle upon announcement of election results by the House of Delegates. (Left) Doctor Slagle; M. A. Darling, M.D., President-Elect; Warren W. Babcock, M.D., Councilor; G. B. Saltonstall, M.D., President; and K. H. Johnson, M.D., Speaker.

*Proven*

in over three years of clinical use  
in over 600 clinical studies

*Specific*

**FOR RELIEF OF ANXIETY  
AND MUSCLE TENSION**

*Selective*

Does not interfere with autonomic function

Does not impair mental efficiency,  
motor control, or normal behavior

Has not produced hypotension,  
agranulocytosis or jaundice

**Miltown®**

MEPROBAMATE (WALLACE)

Supplied: 400 mg. scored tablets, 200 mg. sugar-coated tablets.



WALLACE LABORATORIES, New Brunswick, N. J.

CH-8842

**JANUARY, 1959**

*Say you saw it in the Journal of the Michigan State Medical Society*

45

# AMA Washington Letter

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## THE MONTH IN WASHINGTON

It is now well recognized that the new 86th Congress, heavily spiced with newly-elected Democratic liberals, will set out to make an impressive record for itself. Health legislation will not be neglected.

On the basis of developments last session, and the known interests of many of the new members of Senate and House, here are the health areas where intensive activity is assured, with prospects for enactment of a number of bills either this year or next year, the final session of the 86th Congress and also a presidential election year:

*Social Security.*—Labor has announced that it work this year for substantial changes in social security, the most important being a program for hospital-nursing home care for the aged and other beneficiaries. On this the unions are supported by the Democratic Advisory Council, which reflects the views of the Truman-Stevenson-Butler element of the party but generally finds itself to the left of Senate Leader Johnson, House Speaker Rayburn and some other Congressional leaders.

Under social security, the AFL-CIO and the Democratic Council also would lower or drop the age fifty requirement for disability payments, increase the OASI taxes, bring more income under the taxes, and raise benefits all up and down the line.

American Medical Association, joined by scores of other associations and individuals in health and other activities, successfully opposed the social security hospitalization plan last session. They are prepared to wage just as determined a fight this year.

*Aid to Medical Schools.*—An effort was made in Congress last session to provide grants to medical schools for building and equipping teaching facilities, to complement the research grants program already in effect. While the administration supported the attempt, it did not throw behind it all the energy it is expected to exert this year. Top officials of the Department of Health, Education, and Welfare, from Secretary Flemming on down, have been talking up aid to medical schools all fall. When time comes to testify, they will be strengthened by the activities of a new committee appointed to look into the schools' problems, as well as by the Bayne-Jones report which calls for the immediate start on construction of between fourteen and twenty medical schools.

American Medical Association supports con-

struction and equipment grants for medical teaching facilities. Strongest opposition this year is likely to come from some influential members of Congress, who succeeded in bottling up the legislation last session.

*The Keogh Bill.*—Last session this legislation to permit the self-employed to pay taxes on money withdrawn from retirement funds passed the House but failed to get out of committee in the Senate. Its sponsors, including the AMA, are hopeful that the Senate objections can be removed this year.

*Medicare.*—Congressmen already have received protests from back home about restrictions imposed on the civilian phase of Medicare, mostly the channeling of service families to military facilities. This issue is sure to come up when appropriations hearings start on the Defense Department's budget. It may come up sooner, if Medicare runs out of money and requires a deficiency appropriation.

*The Doctor Draft.*—The special draft, which hasn't actually been used in two years, may be invoked by the Defense Department this spring, if there isn't a better response on the part of interns and residents to the appeals for volunteers. Should the law have to be used this year, the Defense Department will have a pretty convincing argument that it should be extended beyond its scheduled expiration date of next June 30.

*Medical Research.*—While the Federal government currently is spending at a rate of more than \$324 million on medical research through the National Institutes of Health, a still higher record of appropriations is in prospect for next year. The Senate Appropriations Committee has announced that never again will the pace of research be slowed through lack of dollars. This is also the attitude of the AFL-CIO and the Democratic Advisory Council, among other groups. The pattern usually is for the House to increase moderately Budget Bureau figures for medical research, then for the Senate to vote large additional increases. The House then generally agrees to spend close to what the Senate wants.

*Contributory Health Insurance for Federal Workers.*—A new effort to bring about a contributory health insurance program for civilian federal workers is expected, with federal employee unions leading the drive.

# Low Dosage KYNEX<sup>\*</sup> for G.U. Infections

Sulfamethoxypyridazine Lederle



**Unusual Antibacterial and Anti-infective Properties**—More soluble in acid urine<sup>1</sup>... higher and better sustained plasma levels than any other known and useful antibacterial sulfonamide.<sup>2</sup>

**Unprecedented Low Dosage**—Less sulfa for the kidney to cope with... yet fully effective. A single daily dose of 0.5 to 1.0 Gm. maintains higher plasma levels than 4 to 6 Gm. daily of other sulfonamides—a notable asset in prolonged therapy.<sup>2</sup>

**Dosage:** The recommended adult dose is 1 Gm. (2 tablets) the first day, followed by 0.5 Gm. (1 tablet) every day thereafter, or 1 Gm. every other day for mild to moderate infections. In severe infections where prompt, high blood levels are indicated, the initial dose should be 2 Gm. followed by 0.5 Gm. every 24 hours.

## KYNEX—WHEREVER SULFA THERAPY IS INDICATED

**Tablets:** Each tablet contains 0.5 Gm. (7½ grains) of sulfamethoxypyridazine. Bottles of 24 and 100 tablets.

**Syrup:** Each teaspoonful (5 cc.) of caramel-flavored syrup contains 250 mg. of sulfamethoxypyridazine. Bottle of 4 fl. oz.

### References:

1. Griebble, H.G., and Jackson, G.G.: Prolonged Treatment of Urinary-Tract Infections with Sulfamethoxypyridazine. *New England J. Med.* 258:1-7, 1958.

2. Editorial: *New England J. Med.* 258:48-49, 1958.

**LEDERLE LABORATORIES**, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

\*Reg. U. S. Pat. Off.



# PR REPORT

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## SOCIETY OFFICERS MAP SCHEDULE OF VISITS TO WAYNE AREA HOSPITAL STAFFS

Repeat performances are scheduled for medical society officers who last year addressed staff meetings at nearly every Wayne County Hospital. The business and organizational activities of both Michigan State and Wayne County Medical Society will be discussed by respective official representatives.

A total of twenty-two hospitals will be contacted before the program is concluded in June of 1959. It is expected that more than 1,800 doctors of medicine will be reached through this personal contact method which proved so successful last year in informing the membership of important happenings and obtaining first-hand criticism and suggestions for improvement.

As part of the program, the MSMS-produced film, "A Journey Home," will be shown, depicting the transition of the Wayne County Medical Society from the old David Whitney House to its new modern headquarters.

The MSMS PR Field Secretary will act as coordinator for the program and handle technical arrangements for the meetings.

## PRESS CODE APPROVED BY MSMS

A guide for improved communications between the medical profession and news media was approved and adopted by the MSMS Public Relations Committee at its annual meeting recently. Adoption of this or a similar media code by county societies was urged by R. W. Teed, M.D., Committee Chairman.

The MSMS Media Code will be discussed with county society PR Chairman attending the County Secretaries - Public Relations Seminar in late January.

In Wayne County, Sidney E. Chapin, M.D., WCMS PR Committee chairman, announced that the MSMS Media Code was adopted by his committee. The code was introduced to media representatives and physicians at a formal Press Luncheon. At the meeting, names of physician-contacts at each hospital in Wayne County were disclosed.

At least one M.D. was designated as a contact person for the press, and in larger hospitals a PR Committee composed of three doctors of medicine was appointed.

Within the provisions and limitations of the Code, contact physicians will have authority to provide the inquiring press with factual information regarding medical news. Dissemination of hospital news will remain the prerogative of hospital officials.

## NEW TV SCREEN FOR MICHIGAN CLINICAL INSTITUTE SHOWS

The largest and most advanced compatible color TV "set" in the world—a 1500-pound electronic projector capable of presenting pictures 9 by 12 feet—has been built in the Netherlands for use at United States medical meetings, Smith Kline & French Laboratories announced in late November.

The projector, which will be used at the Michigan Clinical Institute, March 10-13, received its U.S. tryout on December 2-5, when SKF presented fifteen hours of closed-circuit medical color TV at the American Medical Association's clinical meeting in Minneapolis.

When Smith Kline & French Laboratories pioneered medical color television more than nine years ago, the only viewing equipment consisted of 10-inch home-style screens. Later came U. S.-built projectors capable of pictures 4 by 6 feet. The larger the picture, however, the less brilliant the projected image—hence SKF's search for an improved projector that would provide both brilliance and large screen-size.

The Philips unit can project pictures four times larger or three times brighter than the most advanced compatible color TV equipment manufactured in the United States. The improvement in brightness and size may make it possible to view medical color television in normally-lit convention auditoriums.

## GRANTS TO WSU TOTAL \$265,000

Gifts and grants totaling \$265,000 were accepted by Wayne State University's Board of Governors at its recent December meeting.

The National Science Foundation (NSF) gave \$131,800 for research and education. This will support training institutes in radiation biology and mathematics, to be conducted next summer for selected Detroit-area high school teachers.

Another \$50,000 of the NSF total will support research into optical rotatory dispersion data by Dr. Carl Djerassi, professor of chemistry in the College of Liberal Arts.

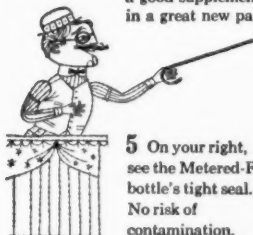
The U.S. Public Health Service, National Institutes of Health, gave \$105,328 to continue two research projects on cancer at the department of pathology of the College of Medicine.

Other grants to support research and training at the College of Medicine included \$7,224 from Harper Hospital, \$5,000 from the Squibb Institute and \$2,500 from Difco Laboratories.

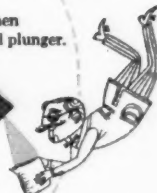
JMSMS



**1** Ladies and gentlemen:  
learn all about new VITERRA PEDIATRIC,  
a good supplement  
in a great new package.



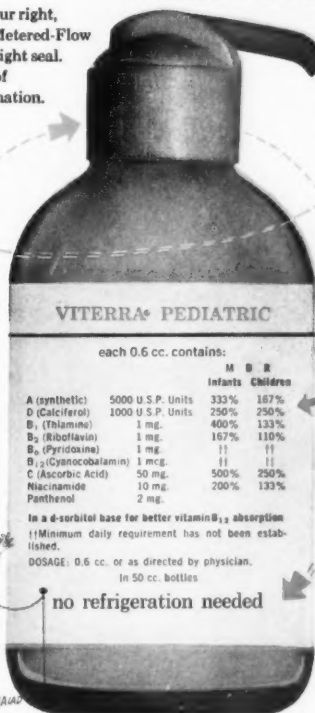
**2** First,  
see what happens when  
you push the metered plunger.



**3** Aha!  
An exact 0.6 cc.  
comes out this spout.  
Never more, never less.

**4** And notice —  
no drip, no waste,  
no sticky bottle.

**5** On your right,  
see the Metered-Flow  
bottle's tight seal.  
No risk of  
contamination.



**6** Let's take a minute  
to admire the formula.



each 0.6 cc. contains:

		M	I	R
		Infants	Children	
A (synthetic)	5000 U.S.P. Units	333%	167%	
D (Calciferol)	1000 U.S.P. Units	250%	250%	
B <sub>1</sub> (Thiamine)	1 mg.	400%	133%	
B <sub>2</sub> (Riboflavin)	1 mg.	167%	110%	
B <sub>6</sub> (Pyridoxine)	1 mg.	11	11	
B <sub>12</sub> (Cyanocobalamin)	1 mcg.	11	11	
C (Ascorbic Acid)	50 mg.	500%	250%	
Niacinamide	10 mg.	200%	133%	
Panthenol	2 mg.			

In a d-sorbitol base for better vitamin B<sub>12</sub> absorption  
†† Minimum daily requirement has not been estab-  
lished.

DOSAGE: 0.6 cc. or as directed by physician.  
In 50 cc. bottles

no refrigeration needed

**7** That means  
no hot-weather  
loss of potency.



**8** Now for a farewell treat,  
a taste of delicious, orange-y  
VITERRA PEDIATRIC. How will  
you have it — in fruit juice?  
On cereal? Straight from the  
spoon?

## VITERRA® PEDIATRIC



ALLOW 30 SECONDS BETWEEN DISPENSINGS

Special note to doctors who took this tour:

Problems of over- and under-dosage, spillage, spoilage  
or leakage disappear with VITERRA PEDIATRIC's new  
Metered-Flow bottle. Why not consider these advan-  
tages when you recommend a vitamin supplement?



New York 17, N. Y.  
Division, Chas. Pfizer & Co., Inc.  
Science for the world's well-being

## *Medicolegal Forms*

Following are two additional simple forms of letters which the careful physician will sometimes find it advisable to use as a precautionary measure.

As usual, these forms have been selected by MSMS Legal Counsel from "Medicolegal Forms with Legal Analysis," prepared and published by the Law Department of the American Medical Association.

### LETTER OF WITHDRAWAL FROM CASE

Dear Mr. \_\_\_\_\_:

I find it necessary to inform you that I am withdrawing from further professional attendance upon you for the reason that you have persisted in refusing to follow my medical advice and treatment. Since your condition requires medical attention, I suggest that you place yourself under the care of another physician without delay. If you so desire, I shall be available professionally to attend you for a reasonable time after you have received this letter, either for regular or emergency medical treatment, but in no event for more than five days following such receipt. This should give you ample time to select a physician of your choice from the many competent practitioners in this city. With your approval, I will make available to this physician your case history and complete information regarding the diagnosis and treatment which you have received from me.

Very truly yours,

\_\_\_\_\_, M.D.

### LETTER TO PATIENT WHO FAILS TO KEEP APPOINTMENT

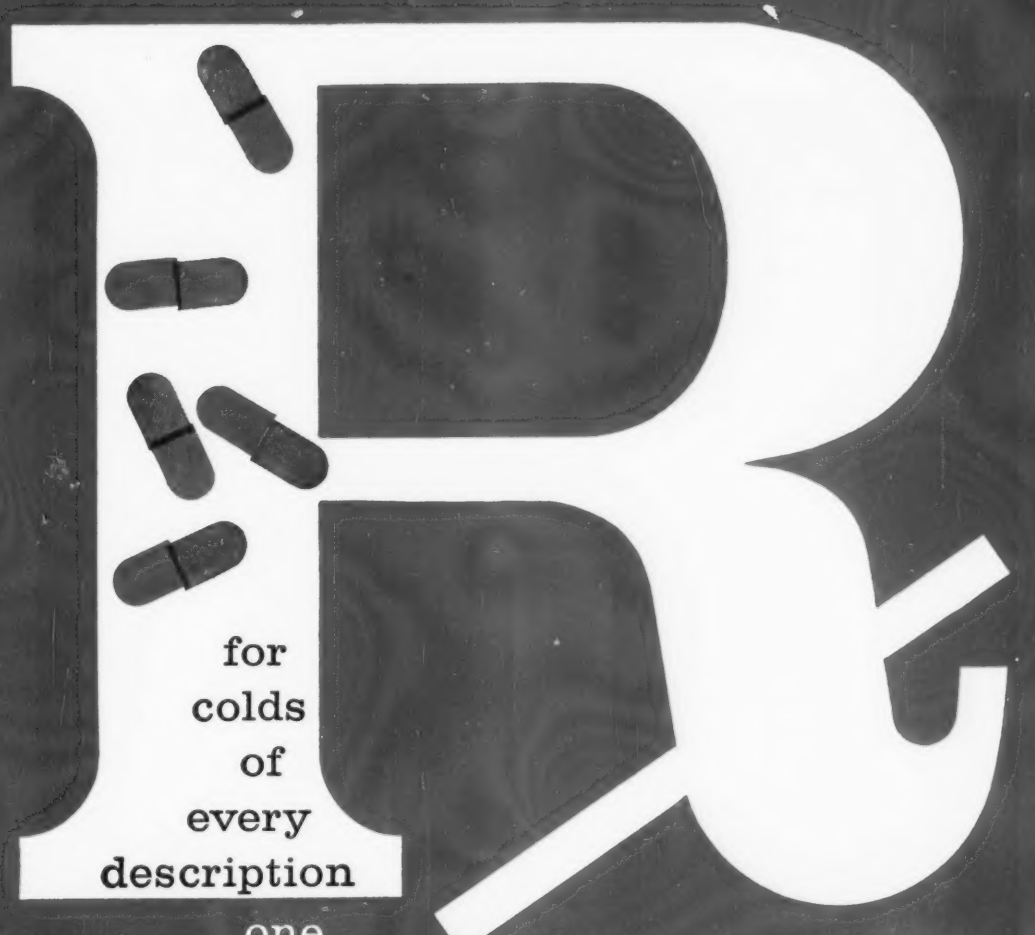
Dear Mr. \_\_\_\_\_:

On \_\_\_\_\_ 19\_\_\_\_, you failed to keep your appointment at my office. In my opinion your condition requires continued medical treatment. If you so desire, you may telephone me for another appointment, but if you prefer to have another physician attend you, I suggest that you arrange to do so without delay. You may be assured that, at your request, I am entirely willing to make available my knowledge of your case.

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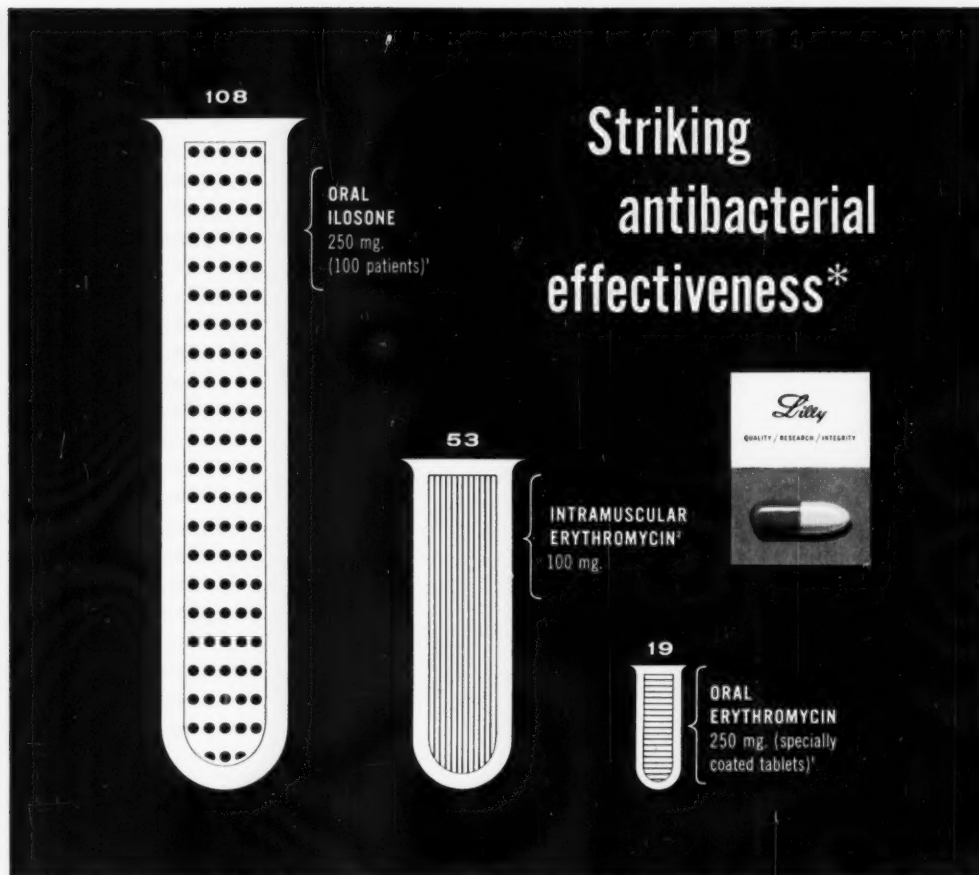
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1. Griffith, R. S., et al.: *Antibiotic Med. & Clin. Therapy*, 5:609 (October), 1958. Note: Peak levels with the oral erythromycin tablets (thirty-three dilutions) were not observed until four hours after administration. 2. Data from Griffith, R. S.: *Antibiotics Annual*, p. 269, 1954-1955.

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# The JOURNAL

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## Physiology of Cardiac Surgery *Hypothermia, Extracorporeal Circulation and Extracorporeal Cooling*

By Frank Gollan, M.D.  
Nashville, Tennessee

THE application of traditional fields of physiologic investigations, like hypothermia and blood perfusion, has lead to such dramatic advances in open cardiac surgery, that in many instances unexpected observations and new facts have come from the operating room and not from the experimental laboratories. It still remains an iron-clad rule to apply for human use only those procedures which have been thoroughly tested in a large series of animals.

The secret weapon is not the sharp knife of the surgeon or the soldering gun of the electronics magician, but reverence for the anoxic tolerance of living tissue. It is well to remember that Beaumont's equipment for the study of open stomach physiology consisted of a glass vial, a thermometer and a sand bag; and that eleven years after a gunshot accident in a trader's store, on an island of the distant frontier by the name of Michilimackinac, he published a cheaply printed book issued from a newspaper office, which Harvey Cushing called the most original paper of American medicine. Although in the last 125 years, our equipment has become much more expensive and elaborate, the two most important research tools are still the cerebral hemispheres of the investigator.

The emphasis on physiologic studies does not imply that we should try strenuously to keep the

internal environment untouched by human hands in order to honor the memory of Claude Bernard. He would have been the first one to remind us to submit dogmatic scholastic ideas and the authority of man to the authority of experiments in nature. Since the names of hypothermia and of extracorporeal circulation imply the intentional change of normal conditions for a definite purpose, conventional thinking has rather hampered than enhanced progress in intracardiac surgery.

At a recent meeting of thoracic surgeons, the story went around that a new society for the prevention of hypothermia to patients was founded. If it is not true it is well invented, because it expresses the disappointment with the limitations of hypothermia as an adjunct to open cardiac surgery. It is also not coincidental that with this period coming seemingly to an end, excellent reviews should have appeared.<sup>†</sup> Thus, there is no need for further reviews of hypothermia and the recorded information will be used solely as material for discussion.

Any single investigator should resist the temptation to write a review of extracorporeal circulation. The rapid progress of this technique reported at a conference sponsored by the Surgery Study Section of the National Institutes of Health was

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<sup>†</sup>The Physiology of Induced Hypothermia, Washington, D. C., National Academy of Sciences, National Research Council, 1956, No. 451; and *Annual Review of Physiology*, Palo Alto, California, Annual Reviews, Inc., and the American Physiological Society, 19:83, 1957.



published recently\* and will probably be hopelessly outdated when the next conference will convene. Therefore, an ambitious effort of an impartial evaluation of presently available equipment or its manifold applications for medical and surgical purposes will not even be attempted.

The exaggerated expectations for prolonged circulatory arrest at low body temperature may have been due partially to semantic confusion and the use of such flowery verbiage as artificial hibernation or suspended animation. The harmonious and gradual lowering of body temperature of hibernating animals and the rapid cooling of anesthetized dogs by ice immersion have hardly more in common than the use of a thermometer for temperature recording.

### Hibernation

At the start of the cold season the body temperature of the furry animals wavers for several days<sup>27,58</sup> and then, without shivering or exhausting, fight the body temperature drops to the environmental temperature of about 5° C.<sup>84</sup> in about eight hours. In hamsters the metabolic rate is only 1/30 to 1/100 of the "resting" rate, the heart beats four times a minute, the circulation time from heart to femoral arteries is prolonged from three to thirty seconds, the mean blood pressure is about 50 mm. Hg, the blood volume decreases about 50 per cent and electrical activity of the cerebral cortex ceases. There exists a moderate respiratory acidosis because the CO<sub>2</sub> content of the blood rises<sup>27</sup> and the blood pH is lowered.<sup>109</sup> Most important of all, in spite of the marked reduction in blood circulation, blood flow in the capillaries seems to be preserved in dilated blood vessels since the feet of hibernating hamsters are bright pink. The longest continuous period of hibernation recorded is 114 days. The autonomous nervous system remains active in this semicomatous condition and a pain stimulus will trigger off the arousing mechanism.

On arousing the animals shiver violently, the temperature of the cranial portion of the body rises to the homeothermic level in about three hours while the caudal part can still be 20° C. colder. Such animals crawl around with their front feet while still dragging their hind feet. This differential temperature change makes their

heart and brain wake up first, while their hind feet are still asleep.

The basic criterion particular to hibernating animals is the excitability of their heart and nerves at 3° C. This inherent quality of hibernating tissue is not abolished by anesthesia. Anesthesia abolishes the ability of spontaneous heat production only and external heat is needed to resuscitate such an animal. Since application of low body temperature for cardiac surgery was introduced eight years ago, the explosive number of publications has emanated more heat than light, because this fundamental problem of different energy availability, enzyme activity and electrolyte transfer of hibernators has not been brought closer to a solution.

### Induced Hypothermia

1. *Early Observations.*—In reading the first description of the cooling of small rodents by Edwards,<sup>20</sup> Walther<sup>115</sup> and Horvath,<sup>66</sup> the exhilaration and excitement of the new observations come to life again after a century of dormancy on library shelves. They established the basic facts that hibernators can be cooled artificially to near 0° C, but that nonhibernating rodents succumb at about 18° C. When respiration and heart beat stopped, Walther threw the rabbits in the ash can and was quite surprised to see them hop around in the laboratory when he returned in the morning.

2. *Military Research.*—It is probable that the first aid in the form of a glass of brandy offered to the pilots of the Royal Air Force immediately after their rescue from the cold Atlantic contributed to the high mortality of these gallant, young men since the peripheral vasodilatation may have lowered their body temperature further. Thus, hypothermia became an acute practical problem and physiologic crash programs were undertaken in the laboratories of the warring air forces. Soon it was confirmed that death in hypothermia below 20° C. could not be attributed to respiratory arrest since even artificial respiration of high oxygen mixtures did not materially lower the terminal body temperature of dogs. Secondly, a shift of the oxyhemoglobin dissociation curve to the left resulting in tissue anoxia has been blamed as the immediate cause of hypothermic death. This attractive assumption has become untenable by the finding that hemoglobin releases sufficient

\*Edited by Dr. J. Garrott Allen, Circulation Extracorporeal, Springfield, Illinois, Charles C Thomas, Publisher, 1958.

oxygen to cover the tissue requirements at low body temperature,<sup>59</sup> and most important, that the coronary arteriovenous difference in oxygen saturation remained unchanged at body temperature as low as 17° C.<sup>60</sup> The demonstration of a beneficial effect of digitalis and of initial rewarming of the heart by a heating element in the deep esophagus<sup>20</sup> were important leads in the testing of other cardiac drugs and of differential temperature changes of organs in the body.

3. *Hypothermia for Intracardiac Surgery.*—In 1950 Bigelow and his co-workers in Canada<sup>5</sup> undertook extensive physiological investigations in hypothermic dogs on the factors making venous inflow occlusion possible and, fortunately, for cardiac surgery, he published his classical work in a surgical journal. This fortuitous fact (at the time ready for it) and the simplicity of the procedure, requiring a bath tub filled with ice water only, shortened the time distance between laboratory and operating room from decades to months.<sup>60</sup>

Hypothermia inspired the imagination and diligence of surgeons and an avalanche of publications from all countries covering many problems of applied physiology and all possible clinical applications followed. In the temperature range of 26 to 28° C. the safety of circulatory arrest could be extended to about eight minutes. It is quite astonishing how much direct vision intracardiac manipulations the skilled and experienced surgeon can accomplish in so few minutes and the correction of thirty-five cases of atrial septal defects without any mortality<sup>111</sup> constitutes a landmark in the history of cardiac surgery. For the correction of more complicated cardiac lesions a longer period of circulatory arrest at a lower temperature would be required and it is at this point that one has to pay for the simplicity of the procedure with the heavy price of ventricular fibrillation with uncertain outcome and the prohibitive price of prolonged anoxia with certain death.

### The Nature of the Hypothermic Injury

1. *Causes of Anoxic Injuries during Cardiac Surgery under Hypothermia.*—The most frequently performed experiment in which a dog is anesthetized with barbiturates, immersed in ice water, subjected to thoracotomy, venous inflow occlusion, right ventriculotomy and finally immersion in warm water, reminds one of the old lady with the many strokes who said: "death nibbles at me by taking a little bite at a time."

Barbiturate anesthesia with its reduction of tissue oxygen tension<sup>78</sup> results in an increase of muscle sodium and chloride and a loss of muscle potassium and glycogen.<sup>36</sup> If shivering occurs the oxygen consumption is raised to such an extent that oxygen supply becomes severely insufficient and more barbiturates have to be administered. Thoracotomy, like all major surgery, results in an additional loss of potassium and nitrogen and retention of sodium. Venous inflow occlusion, the only calculated anoxic risk, is prolonged to the last drop of red blood and causes a 90 per cent drop of cerebral oxygen tension in the first four minutes.<sup>70</sup> Even if the hypothermic heart would not be more irritable than the normothermic one, any self respecting ventricle subjected to long incisions, stay sutures pulling in all directions, its septum punctured by needle holes, its fibers compressed by "non-crushing" clamps and pulled together by sutures, would consider fibrillation a timid act of self defense. If all goes well and electric shock and cardiac massage have restored a regular beat, the still cold heart is expected to perfuse adequately the entire periphery of the body, whose oxygen consumption has been suddenly raised to the level of normal body temperature. Although rapid rewarming may have a place in the treatment of frozen limbs,<sup>77</sup> in the resuscitation after immersion hypothermia the demands by the periphery of the body for a normal supply of oxygen cannot be met yet by the slowly beating heart pumping a reduced blood volume. As in burn injuries, the heart in turn is affected by severe tissue anoxia<sup>41</sup> and the lowest outputs occur during the early rewarming periods<sup>91</sup> when severe metabolic acidosis develops.<sup>7</sup> Recognizing these grave dangers of immersion hypothermia the most successful surgeon remarked with refreshing frankness: "I always have been scared to death of it. My philosophy has been that I do not know what is going on, I have some very definite purposes for it, and I would like to induce it and get the job done and get the patient back up where I believe I can understand him a little better, as quickly as possible. This is an emotional approach, as you can see."<sup>116</sup>

2. *Biochemical Changes.*—These limitations of induced hypothermia for open cardiac surgery have focused interest on electrolyte disturbances as the cause of the increased myocardial irritability and death due to ventricular fibrillation. No significant changes were found in serum sodium,

magnesium, chlorides and phosphorus, whereas, an increase in serum calcium was a rather consistent finding.<sup>67</sup> Differences in anesthesia, respira-

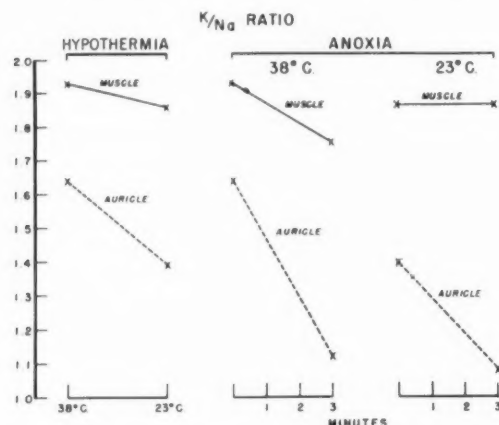


Fig. 1. Potassium-sodium ratio of resting skeletal muscle and beating cardiac auricle during immersion hypothermia and after three minutes of anoxic anoxia during normothermia and hypothermia. (Reproduced by courtesy of *American Journal of Physiology*.)

tion and duration of hypothermia probably account for the variability in serum potassium. These discrepancies of serum potassium changes have led investigators to look for intracellular changes. A rise in the potassium content of coronary sinus blood,<sup>19</sup> indicated that a disturbance in the transfer of electrolytes may play a role in hypothermic ventricular fibrillation.

We have determined the distribution of radio-active potassium and sodium in the myocardium during hypothermia<sup>96</sup> and found a reduction of the potassium/sodium ratio (Fig. 1). The same disturbance could be aggravated by subjecting the hypothermic heart to anoxia. Thus, the increased irritability of the myocardium during hypothermia and anoxia has a common chemical denominator in the decreased potassium/sodium ratio. The inability of anoxic tissue, deprived of its aerobic energy to repeal actively the intrusion of sodium and to retain its potassium, results in a lowering of the electrostatic potential across the membrane.<sup>70</sup> It is not too difficult to understand that if all the other organs in hypothermia "go to sleep," the heart still has to stay awake and to go on with its work. Although the passengers in the cabins of the ship are all asleep, the fellows down in the boiler room still have to burn carbohydrates and to work the "sodium pump." They do not shovel the fuel as fast as when their temperature

was high, but now each single move takes longer and they are not given enough time off to recharge their batteries to bail out the rising sodium and to recover the lost potassium. As this process goes on they have to use more and more of their available energy for their attempts to push out the sodium, instead of for the original task to make the ship run and when they finally drown in sodium the passage comes to an end.

Such a process can partially explain myocardial failure in poorly oxygenated animals and patients and the later onset and less frequent ventricular fibrillation under hyperventilation.<sup>112</sup> However, it does not explain the mechanism of ventricular fibrillation in well oxygenated animals in whom coronary flow is not only sufficient<sup>4</sup> but due to decreased vascular resistance more than adequate<sup>99</sup> so that no signs of myocardial failure can be detected.<sup>3</sup>

In an evaluation of a causative effect of calcium on hypothermic fibrillation one is hampered by the lack of determination of myocardial calcium content and by the masking of possible variations by total calcium determination. It is the ultra-filtrable or ionizable calcium fraction only which varies inversely with the hydrogen ion concentration.<sup>113</sup> Still, the circumstantial evidence for an active participation of calcium is an impressive one. Hypothermic hearts show a much greater sensitivity to the effects of calcium and potassium than those at normal body temperature<sup>90</sup> and the rise of ionizable serum calcium during respiratory acidosis may account for the frequency, and the fall in ionizable calcium during hyperventilation for the low incidence of ventricular fibrillation. Furthermore, ten hypercapnic dogs suffering fibrillary death exhibited a positive arteriovenous calcium difference, whereas, eight hypercapnic dogs who went into cardiac arrest without fibrillation showed a slightly negative myocardial calcium balance.<sup>19</sup> Thus, regardless of the low blood pH, it was always the entry of calcium in the myocardium which determined the outcome. The observation that frogs in winter have a low and in summer a high serum calcium, and that the injection of calcium converts winter frogs into summer frogs, is a fitting biologic analogy.<sup>79</sup> Thus far, we have seen that changes in potassium, sodium and calcium occur in the hypothermic heart which are compatible with cellular anoxia, but in the absence of anoxemia we have been unable to localize the anoxic injury.

3. *Histopathological Changes.*—It is symptomatic of the contemporary neglect of systematic morphologic studies that only recently generalized interstitial edema,<sup>102</sup> fatty infiltration, deple-

capillaries and venules in the rat mesentery at 20° C. and in the hamster cheek pouch at 10° C. did not reveal vasoconstriction, but total cessation of flow in at least half of the blood vessels ob-

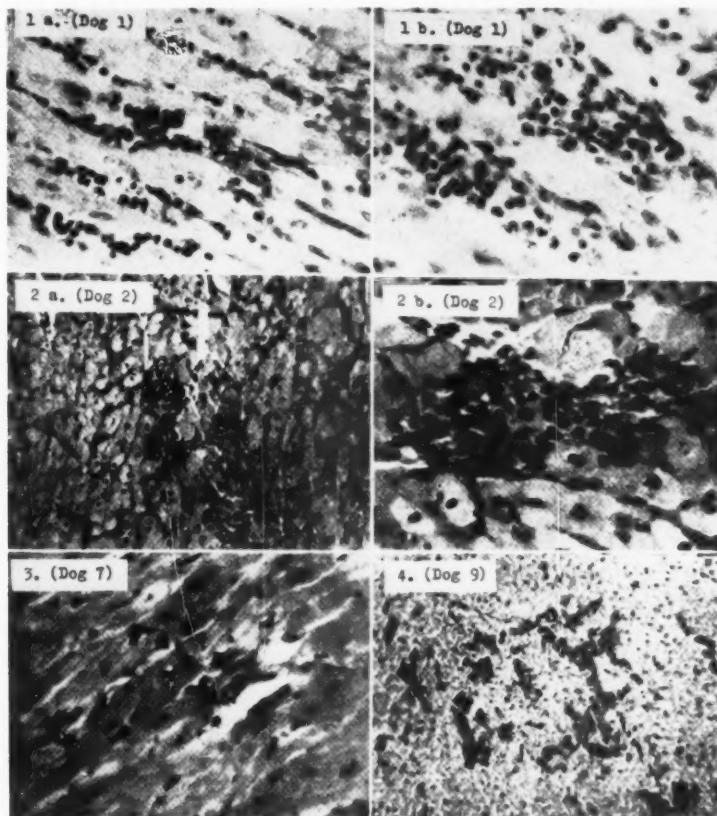


Fig. 2. Hyaline necrosis of myocardial fibers associated with early reactive cellular phenomena caused by immersion hypothermia of 26° C. of four hours' duration. H. S. S. Sarajas: Evidence for Heart Damage in Association with Systemic Hypothermia in Dogs. *American Heart Journal*, 51:298-305 (Feb.) 1956. (Reproduced by courtesy of *American Heart Journal*.)

tion of glycogen and vasculization of cells<sup>74</sup> as well as small necrotic foci were found in the myocardium<sup>101</sup> at temperatures considered optimal for cardiac operations. These foci of myocardial necrosis corresponded grossly and histologically to the successive stages of myocardial infarction<sup>2</sup> (Fig. 2).

4. *Physiopathological Changes.*—The most plausible cause of microscopic myocardial infarcts is microscopic coronary occlusion or, functionally speaking, cessation of blood flow in some capillaries.<sup>85,98</sup> Microscopic observations of minute

served. These stoppages of flow through selected capillaries and venules were reversed during re-warming.

If we take a blood sample from a vein we will obviously aspirate flowing blood from perfused tissue only, and we will miss the chemical changes which occur in the stagnating blood of microscopic capillaries and venules which is not available to our syringe. If this phenomenon is generally applicable to all organs—as histochemical evidence strongly indicates—then it is not surprising that the search for over-all chemical changes in the systemic blood has been mainly negative, because

we were literally "barking up the wrong vascular tree." One can explain the detectable changes of myocardial anoxia in coronary sinus blood by the higher metabolic activity of the heart and the possible stoppage and re-establishment of flow through some capillaries due to the changing ventricular contractions. The tiny foci of myocardial anoxia, increasing in number and size as hypothermia progresses, could easily produce gradients of potassium, sodium, calcium and hydrogen between neighboring fibers and thus account for the electrocardiographic time course of repolarization and ventricular fibrillation. The sequestration of blood in capillaries may also solve the mystery of the missing platelets and leukocytes<sup>61</sup> which may under these conditions agglutinate more readily than red cells. If it could be established that the degree of fall in leukocytes and platelets in the systemic blood is proportional to the stasis in capillary beds, a simple test would be available for the study of this hidden phenomenon in the intact animal. That such a relationship might exist is indicated by the interesting observation that in cooled dogs with autonomic blockade, the platelet count remained unchanged.<sup>60</sup>

Capillary perfusion deficiency is the most probable pathologic basis of hypothermia and throws light on the progressive metabolic acidosis which develops in the presence of a normal  $p\text{CO}_2$  and decreased  $\text{CO}_2$ ,<sup>33</sup> and on the cardiac decompensation and increasing death rate which occurs if a stable body temperature of 23° C. is extended to twenty-four hours.<sup>32</sup> The time limit of stable, moderate hypothermia lends support to the growing evidence that the lowering of body temperature as an adjunct to open cardiac surgery does not merely produce a state of reduced physiologic activity, but also one of severe pathologic dysfunction. If used for a short period one may "get away with murder," but this does not change the indictment. To change the terminology from "slow motion life" to "cold stress" with or without "alarm reaction" or "general adaption," would expand our vocabulary without increasing our knowledge.

#### Possible Subjects of Future Investigations

At this point of the discussion it may appear that hypothermia *per se* has had its short moment of truth in the bright arena of cardiac surgery and is headed for oblivion. Albert Einstein warned us not to give up an useful theory too soon, by

saying: "*Once a theoretical idea has been acquired, one does well to hold fast to it until it leads to an untenable conclusion.*" There are many stubborn facts uncovered by physiologists of many lands which should warn investigating cardiac surgeons that they may be burying hypothermia alive.

#### Extracorporeal Circulation

The urgent need for surgical repair in congenital and acquired heart disease provided the vigorous and imaginative impetus which has made the short-term application of so-called "artificial heart and lungs" a clinical reality. Since this name might imply the almost sacrilegious creation of these organs by human effort, the term pump-oxygenator, which describes the limited function of these devices, appears to be more appropriate. It is hard to single out one investigator or one discovery which has made this brave, new world of cardiac surgery possible because the seemingly sudden eruption of brilliant exploits is due to a century long smouldering of intellectual curiosity. The technical details of total body perfusion have been perfected to such a degree, that the difficulties encountered are not those of mechanical, but of biological engineering. The great variety of available instruments prove that all pump-oxygenators will do two things only: they pump and they oxygenate. It is not the kind of a car, but the kind of driving, just as it is not the kind of anesthetic, but the kind of anesthetist, which will prevent accidents. The unprecedented combination of instrumental and physiologic intricacy necessitates teamwork and makes the lone-wolf type of worker or the egotistic soloist a luxury. This does not imply that a large orchestra of well-trained musicians will guarantee success, since they still need the inspiring drive and sensitive interpretation of a conductor. A reasonable constancy of this team should also be assured, because nothing can ruin the best orchestra faster than a rapid succession of guest conductors. A rich instrumentation with a physiologist as concert master may be advisable, though one should be aware of the fact that the interdisciplinary approach may produce cross-fertilization, as well as cross-sterilization. Because of the duration and complexity of such experiments, strictly controlled conditions are almost impossible and the intangible human factor gains in importance. Just like King Midas turned anything he touched into gold, the sur-



geons in Minneapolis<sup>81</sup> succeeded with controlled cross circulation, perfusion from a reservoir of arterialized blood, the use of a dog lung and of an artificial oxygenator. Other investigators may change midstream from one horse of the apocalypse to another and disaster is inescapable—as expressed in an ancient proverb: "*Quot licet Jovi non licet bovi.*"

### Principle of Pump-Oxygenators

1. *Pumps*.—Any pump which moves fluid in one direction can serve as a blood pump, provided blood is treated with the gentleness it deserves. The safest way to start is always to imitate nature and to produce a pulse wave of high amplitude. A mechanical or hydraulic piston compressing a rubber membrane<sup>21</sup> with internal valves to give direction to the flow, has served this purpose admirably during the last thirty years.

An electrically controlled gas piston<sup>14</sup> which avoids contact with any moving membrane, treats the blood with even greater respect.

More frequent pulsations of lower amplitude can be produced by occluding an elastic tube by the circling motion of rollers,<sup>87</sup> metal fingers<sup>100</sup> or any other transmitted wave. This was an important innovation because it proved that the frequency and configuration of the normal pulse are not necessary.

The obvious next step was the elimination of all pulsations<sup>106</sup> and the demonstration that continuous flow for six hours maintained all normal functions. By inserting a large elastic chamber into the outflow tube one can confirm this finding easily. The heart just happens to be a hollow muscle with forceful pulsations and inimitable valves, but the dogs do not care about that at all. All they want is oxygen.

2. *Oxygenators*.—An attempt to imitate pulmonary function in the laboratory appears at first thought to be a foolhardy bravado of Münchhausenian proportions, since it implies the spreading of about 5 liters of venous blood into a microscopically thin film covering an oxygen tent of the surface area of a tennis court and returning it under high pressure into an artery—all in one minute. Still, it has been done more than 2000 times.

Up to now only two principles have been discovered to produce the huge interface between

red cells and oxygen. In 1885 Max von Frey and Max Gruber spread blood over the inner surface of a rotating cylinder (Fig. 3) in order to study the metabolism of isolated organs<sup>34</sup> and

FILM OXYGENATOR  
(FREY AND GRUBER, 1885)

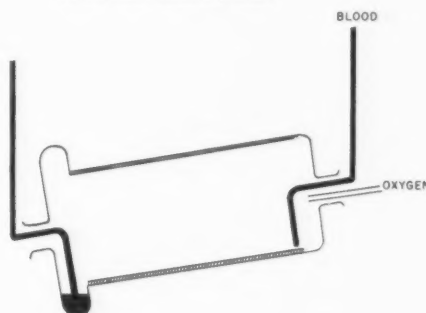


Fig. 3. Principle of film oxygenator by Frey and Gruber, 1885.

although their maze of tubes and bottles served their purpose, most physiologists preferred to use the circulation by another animal. Lasting credit goes to the vision and perseverance of Gibbon who developed the principle of blood filming and reported the maintenance of life during clamping of the pulmonary artery in 1937,<sup>38</sup> the first series of consecutively surviving dogs after total cardiopulmonary by-pass in 1952<sup>10</sup> and the first successful human application on May 18, 1953.<sup>10</sup>

The kind and shape of surfaces blood could cover is limitless and at present highly efficient oxygenators consist of screens which are filmed with blood like window screens on rainy days<sup>95</sup> or rotating discs dipping into a trough of blood like a great number of phonograph records being played at the same time.<sup>6</sup> A most promising development is based on the observation that blood can be oxygenated by flowing through the cellophane tubing of an artificial kidney<sup>75</sup> and thus a large surface area between sheets of oxygen-permeable membranes can be created.

In the only other developed principle of oxygenation the large interface between red cells and oxygen is created inside the blood by bubbling the gas through it. This was first attempted by W. von Schroder in 1882<sup>102</sup> who studied the urea production of a perfused kidney. So little did he think of his bubble oxygenator that he did not even publish a diagram and the author

hopes that the drawing comes close to Schroder's description (Fig. 4). From an elevated reservoir a bottle is slowly filled with blood while air is bubbled into it. On top of this bottle is another

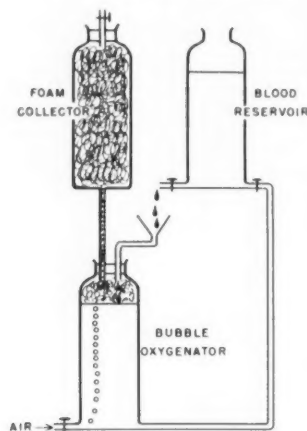


Fig. 4. Principle of bubble oxygenator by Schröder, 1882.

one to prevent the foam from spilling over the table. Schroder had to oxygenate by air bubbles many liters of blood to perfuse a dog's kidney and when finally all the blood was converted into pink foam, he had to start all over again. Schroder did not have an efficient bubble oxygenator but he had a very good idea. This problem was re-examined by Clark, Gollan and Gupta in 1950<sup>13</sup> and it was found that a fine dispersion of oxygen into blood, like an incorporation of millions of tiny alveoli without membranes, produced instantaneous oxygenation of large volumes of venous blood. The excess of tiny bubbles was made to coalesce into large ones by bringing them in contact with a large surface area coated with an antifoam compound, and after the large bubbles, consisting of oxygen and carbon dioxide, had escaped to the atmosphere, the blood, freed of gas bubbles, was returned to the animal.

Fortunately, the antifoam compound is harmless and a small amount diluted in a large volume of an organic solvent can coat efficiently the defoaming surface to prevent embolic phenomena. The smaller the size of the bubble the more efficient the oxygenation and one can calculate that 1 ml. of oxygen dispersed into 1 million bubbles would mimic the surface area of the lungs.<sup>11</sup> It is obvious that smaller bubbles will also need a larger antifoam surface area and it is this misconception of the size of the defoaming surface which has

prevented the widespread application of the most efficient method of blood oxygenation. The passage of an emulsion of tiny oxygen bubbles into the outflow line is undesirable and can always be prevented by the proper design of a sufficiently large defoaming surface area, but it is not as dangerous as one might think. During the early development of this type of oxygenator many dogs received such tiny oxygen bubbles intra-arterially without any clinical detectable neurological damage. In fact, the intravenous administration of a fine dispersion of oxygen can maintain the life of dogs breathing nitrogen for one hour.<sup>78</sup> In the death of an artificially oxygenated animal oxygen embolism is easy to suspect, but hard to prove.

Oxygenation with big bubbles requires more time in a larger blood volume, but the defoaming surface can be smaller. Although counter flow makes this procedure more efficient,<sup>42,115</sup> most investigators let blood and oxygen flow in the same direction.<sup>80</sup> At present, the question as to the best equipment to guarantee the survival of patients is as difficult to answer as the question of the best house to assure a happy home life. There is little doubt that a simple and small device requiring the least controls and tests will evolve.

#### Physiology of Total Body Perfusion

The availability of efficient pump-oxygenators extends the study of a perfused organ to the study of a perfused organism. An evaluation of the effects of total body perfusion is made difficult by the fact that the procedure affects the perfusate as well as the perfused and that an exact duplication of all physiological parameters is unattainable.

All aspects of safety and efficiency of the equipment and procedure can be tested in closed-chest animals and such a simple experiment can be used to acquire the conditioned reflexes to sense technical difficulties before they start.<sup>49</sup> As a next step, double-lumen balloon catheters can be introduced into the large veins to produce a cardiopulmonary by-pass in unanesthetized dogs<sup>47</sup> and if such animals survive without ill effect, the experimenter is ready for the big jump: to open the chest. If from now on animals do not wake up properly or die, the cause should be sought in a cumulative chain of little anoxic insults like anesthesia, surgical trauma, hypotension during the cannulation of the right auricle, blood loss, faulty artificial respiration, hemothorax, pneumothorax

and infections. By such a step-wise procedure of testing and learning the investigator who enters this difficult and challenging field may save himself a great deal of confusion and disappointment and on rare nights he even may go home, instead of "going to the dogs."

1. *Corpuscular Elements.*—The early fears of excessive destruction of blood cells by pump oxygenators have fortunately not come true and the degree of hemolysis has been reduced to an acceptable level. However, the life expectancy of the red cells subjected to the procedure is reduced to about one third of normal<sup>62</sup> and the exploration of a possible hemolytic immune mechanism would be of interest.

It is not known whether the much greater reduction of leukocytes and platelets is due to destruction or to retention in the extracorporeal circuit. Since as much as 50 per cent of platelets disappear at times, one should be able to detect their presence on the surface of the instrument by a serotonin determination of the wash water. It is hard to explain why there is no marked difference in the degree of these changes after the use of various types of instruments, and therefore, it might be that these cells are sequestered in stagnating capillary beds.

2. *Blood Clotting.*—Many years ago the fear was justified that postoperative hemorrhage after the injection of large amounts of heparin would mar success in human applications. Experience has shown, however, that meticulous hemostasis, accurate titrations with protamine and careful replacement of losses with coagulable blood have moved this danger from the top to the bottom of the list. Therefore, it is safer to use more heparin than absolutely necessary since the damages due to a too low heparin level, like fibrin embolism and severe hemolysis, are irreparable. Considering the ever increasing complexity of the clotting mechanism, it is sheer luck that extracorporeal circulation has not contributed a new factor.

3. *Flow Rate.*—In theory, there is no problem because the basal metabolic rate and the cardiac output for all age groups are known and an equation can be written which can serve generally as a reliable guide (Fig. 5).

The absence of mortality due to perfusion in thirty-nine consecutive cases in which the cardiac

index of the patient was met by the flow rate is another proud accomplishment of the surgeons and physiologists at the Mayo Clinic.<sup>73</sup> Forty consecutive cases with a wide variety of cardiac

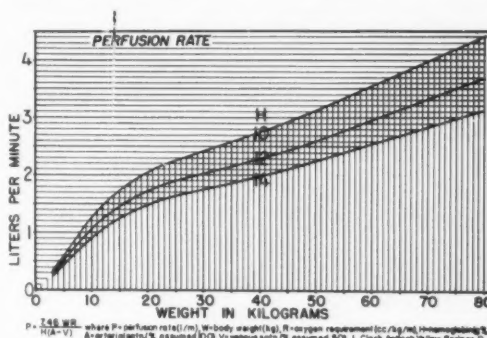


Fig. 5. Calculation of adequate perfusion rate. (Reproduced by courtesy of Charles C Thomas Company, Springfield, Illinois.)

lesions with only one postoperative death were also reported by the group of dynamic surgeons of the University of Minnesota<sup>114</sup> who used a somewhat lower rate of flow. This is not surprising and indicates that there are many other important factors besides rate of flow. For instance, the first group maintained oxygen tension in the arterial line between 100 and 250 mm. Hg, the latter derived additional benefit from a much higher oxygen tension.

The surprising phenomenon that during controlled cross-circulation and after occlusion of both vena cava, the venous return from the azygos vein, or about one-fifth of the normal cardiac output, provides sufficient flow to permit intracardiac surgery<sup>1</sup> cannot be applied to perfusion with pump oxygenators, unless the conditions of cerebral venous flow are kept the same in both conditions. After the occlusion of the vena cava some collateral cerebral venous blood returns via the azygos vein and thus a controlled increase in the cerebral venous pressure and cerebral spinal pressure occurs. This back pressure probably slows down capillary flow and makes a more complete extraction of oxygen possible, since the electroencephalogram remains normal. The moment cerebral venous pressure falls, the electroencephalogram disappears.<sup>87</sup> If the azygos vein is tied off and the central venous pressure is kept normal by drainage into a pump oxygenator, all components of the "azygos flow principle" are abolished.

4. *Criteria of Adequate Perfusion.*—At present there is no single physical measurement which can compare with the best criterion of adequate perfusion, namely, the survival of the patient.

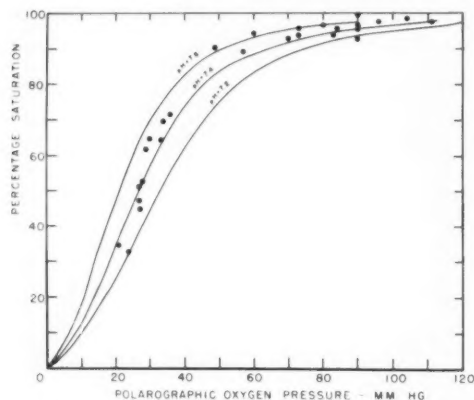


Fig. 6. Oxygen dissociation curve in whole blood as determined by oxygen saturation, pH and direct polarographic measurement of oxygen tension with a Clark electrode.

It seems that constant monitoring of the electroencephalogram comes closest to the requirement of a single reliable test, because it is a sensitive and rapidly reacting indicator of available oxygen in the most sensitive tissue, the brain.

The degree of oxygen saturation of the mixed venous blood in the inflow line to the instrument is the final result of total oxygen supply and demand of the body and therefore constitutes a direct measurement of the adequacy of total body perfusion. Any factor which upsets this vital balance, like flow and oxygen saturation of arterialized blood to all tissues, will effect this measurement. If the saturation of the mixed venous blood is kept between 70 to 80 per cent saturation during the entire period of the patient's stay in the operating room, there is no reason to suspect that the tissues Gargantuan appetite for oxygen has not been satisfied at all times. In addition, the normal electroencephalogram gives assurance that the distribution of food has been satisfactory to the most demanding customer. The difficulty in recording continuously venous oxygen saturation does not detract from its importance.

Oxygen saturation and tension follow an almost linear course in the venous part of the dissociation curve, and therefore, venous oxygen tension measurements would be at least as valuable as indica-

tor for adequate perfusion as venous oxygen saturation. Based on the principle of polarography<sup>64</sup> platinum electrodes can serve as cathodes<sup>22</sup> and if they are protected from direct contact with blood or tissue by a plastic membrane<sup>11</sup> they record oxygen tension independently of pH. In fact, if temperature and turbulence of blood are kept constant, the accuracy of the recording of venous oxygen tension is high enough to make one envisage an electronic control of the rate of perfusion by such a device (Fig. 6).

Constant recording of arterial and venous blood pressure and measurement of blood flow may be listed next, because the methods are readily available. Since the pressure-flow relationship during extracorporeal circulation is a fairly linear one, these measurements complement each other. The measurement of flow is more important, because the blood pressure during perfusion is influenced by still unexplored vasomotor changes. Even if the extracorporeal blood flow approximates the previously determined cardiac output of the patient, the mean aortic blood pressure is always lower during the perfusion and the central systolic peak exceeds the peripheral one by 5 to 20 mm. Hg.<sup>25</sup> The fact that the pressure-flow curves can be made perfectly linear by the administration of a vasodilator indicates an increased vascular resistance during total body perfusion.<sup>93</sup> There is an increase of plasma epinephrine and arterenol during cardiopulmonary by-pass,<sup>106</sup> but it may not be large enough to raise the systemic arterial pressure. Therefore, it is probable that the increased vascular resistance during perfusion is due to localized closure of arterioles and that the administration of vasodilating drugs may improve capillary perfusion. Other manifestations of a reduction of the patient's circulating blood volume during perfusion may be seen in the fact that the withdrawal of 10 per cent of the calculated blood volume will reduce the rate of flow by almost 50 per cent and that the flow will continue at such a reduced rate until the small volume withdrawn is returned.<sup>25</sup> To obtain flow rates approximating normal cardiac output of dogs, it is necessary to expand the blood volume to an average of 130 per cent of the control value.<sup>61</sup> Large amounts of blood stagnating in capillary beds can probably be mobilized by increasing the extracorporeal flow rate and the resulting increase in total oxygen consumption<sup>106</sup> may reflect the larger amount of tissue being in turn called for active duty.

The pH is an unreliable criterion of adequate perfusion because in the extracorporeal circuit the highly diffusible carbon dioxide is usually equilibrated with 100 per cent oxygen against the negligible carbon dioxide tension of the atmospheric air and by this excessive removal of carbon dioxide by the "artificial lung" an "artificial pH" is created. Thus, a normal pH may give the investigator a sense of false security because the usual asphyxia warning signal of a lowered pH has failed to sound off in time. Many unexplainable deaths after "admirable performance of the instrument" may be due to the masking of severe anoxia by a normal pH during the perfusion. After the pump is stopped the anoxic injury is slowly unmasked by a falling pH because there is not enough base bicarbonate to neutralize the excess of organic acids and the punishment of postoperative shock will fit the "perfect crime" of inadequate perfusion. The administration of sodium buffers to "doctor up" the blood pH may expand the blood volume temporarily, but the sodium will probably follow the base bicarbonate to create first intracellular and then extracellular edema. It is too euphemistic and insipid a term to call this condition a metabolic acidosis, since this category encompasses such harmless conditions as hyperchloremia, and therefore, the descriptive clinical name of reversible and irreversible anoxic shock may alert the physician more to the inherent danger of the situation and may induce him to reach for plasma and arterenol instead of an "antacid."

It is a different matter to study the effect of carbon dioxide for its own sake and to follow the advice of Lawrence Joseph Henderson: "In studying the interaction between oxygen and carbon dioxide, it is of the first importance not to regard the change in one substance as cause and the change in the other as effect. If we think of our terms mathematically as variables and as functions, the difficulty does not arise." One can convince oneself easily that high alveolar concentrations of carbon dioxide can be tolerated as long as the oxygen requirement of the body is covered since dogs can survive 55 per cent  $\text{CO}_2$  and a venous pH of 6.78 for forty-five minutes.<sup>20</sup> It would not be surprising if the Giaja effect of high carbon dioxide tension in hypothermia with its lowering of oxygen consumption and almost two-fold increase in cerebral blood flow<sup>71</sup> would also be beneficial in total body perfusion.

Considering the unassailable evidence of anoxic injury due to inadequate perfusion and the lack of evidence of any harmful effect due to over-oxygenation, the problem should be redefined from: *With how little blood can I get away with?* to: *How much blood can I get?* Such a general attitude would increase the safety of the procedure in the smaller hospitals, without ignoring the fact that a highly skilled virtuoso can resect and replace the entire ascending aorta in fusiform aneurysm using lower rates of flow for shorter periods of time.<sup>18</sup>

Occasional technical difficulties in obtaining the desired rate of flow and the increasing duration and complexity of heart operations will probably induce investigators to search for a wider margin of safety since a large oxygen debt cannot be repaid to the patient, but to his survivors only. By combining hypothermia and extracorporeal circulation a third technique with the new effects emerges which can overcome the perfusion deficits in hypothermia and extracorporeal circulation.

#### Extracorporeal Cooling

At the beginning of World War I, J. F. Heymans at the University of Ghent in Belgium constructed a glass cannula with a water jacket which enabled him to cool and to warm the blood in a carotido-jugular shunt in more than 300 rabbits. By directing the flow of blood up or down the jugular vein, he induced pronounced temperature changes in the brain or in the heart and a thorough study of hemodynamic and respiratory functions enabled him to explore the brain damage above 43° C. and the cardiac crisis below 18° C. After the occupation of Ghent in October 1914, these experiments were conducted with feverish diligence because Heymans knew that his moments in the laboratory were numbered. For the last two years he was not permitted to enter his institute and wrote and finished his monumental work without being able to communicate with other investigators or to consult a library.<sup>63</sup>

#### Combination of Peripheral Cooling and Extracorporeal Circulation

When the possibilities of hypothermia for cardiac surgery were explored after World War II, Heymans' method was revived in England<sup>23</sup> and found even clinical application as vein-to-vein cooling.<sup>8</sup> Although this method can be applied in the open chest without injury to an artery, it



does not overcome the basic limitations of surface cooling.

A next step was taken by many investigators who have shown that ice immersion hypothermia could be made safer by coronary perfusion with oxygenated blood.<sup>16</sup>

When pump oxygenators became generally available such selective perfusion of organs during hypothermia was extended to total body perfusion in animals<sup>69</sup> and man.<sup>104</sup> Such a combination eliminates the danger of ventricular fibrillation by providing adequate body perfusion and simplifies all aspects of the technique of total body perfusion. If the same low flow rate of 40 cc./kg./min. is used in normothermic and hypothermic dogs, the much larger margin of safety at 29° C. expresses itself in a blood pressure rise of 65 mm. Hg. and a rise of venous oxygen saturation of 36 per cent.<sup>72</sup> Because of the greater resistance to anoxia, even lower flow rates have been used successfully in patients for periods not exceeding thirty minutes.<sup>103</sup>

The physiologic advantages of hypothermia and extracorporeal circulation complemented each other, but the technical disadvantages of two separate and successive methods make such a procedure time consuming and cumbersome. One can melt both methods into one by fusing the equivalent of a Heymans cannula into any part of the extracorporeal circuit<sup>48</sup> or by using a pump oxygenator also as a heat exchanger (Fig. 7).

### Cooling by Means of a Pump Oxygenator

Although the following discussion contains speculations on some clinical applications, it should be stressed that the function of the physiologist is to explore body functions and not to advocate practical applications. Experimental findings should be confirmed and not promoted.

1. *Anesthesia.*—The animals are pretreated with 50 mg. of chlorpromazine because the phenothiazine compounds seem to exert the same beneficial effect in blood cooling as in surface cooling. For tracheal intubation, skin incision to free one pair of femoral blood vessels, as well as for the start of blood cooling, small amounts of a fast acting barbiturate are given as needed. The first wave of cold arterial blood appears to be very painful and therefore an anesthetizing and not a curarizing agent should be used. From now on, there is hardly any need to increase the

level of anesthesia, because shivering by blood-cooling is minimal or absent and rapid cold narcosis becomes instrumental before the chest is opened. Thus, the degree and duration of general anesthesia can be markedly reduced.

2. *Cannulation of Blood Vessels.*—One single catheter with multiple openings advanced from a femoral vein into the caval system withdraws enough blood to start the procedure. The oxygenated blood is returned through a long femoral catheter threaded up into the thoracic aorta below the level of the left subclavian artery. By the cannulation of two peripheral blood vessels only central cooling by means of partial cardiopulmonary by-pass can be started without delay. Thus, the oxygen demand of the internal organs is reduced first, before the organism is subjected to the usual hazards of deep anesthesia, thoracotomy, blood loss, artificial respiration and cannulation of the large thoracic blood vessels. This part of the procedure might make it possible to offer the benefit of open cardiac surgery to those patients who need it most, but are considered too poor risks to stand even the preparatory traumas of cardiopulmonary by-pass at normal body temperature. Since partial by-pass of the heart and lungs by the cannulation of peripheral vessels has been shown to be beneficial in pulmonary edema<sup>86</sup> and in the prevention of cardiovascular shock,<sup>84</sup> one might attempt such an acute medical preparation for surgery in those patients whose cardiac decompensation does not respond to prolonged medical management.

The cannulation of the vena cava superior can be done later when the chest is open. For left cardiectomies at low body temperatures, venous inflow occlusion is not necessary since the catheters placed in the right heart shunt the entire reduced blood volume into the instrument.

3. *Blood Clotting.*—During the period of blood-cooling the activity of small amounts of heparin is prolonged and during the rewarming period heparin is metabolized at a faster rate; or, more efficient use of heparin is made while it is needed and faster disappearance of heparin occurs when it is not needed any more. It is not known to what extent the prolongation of clotting time during hypothermia participates in this phenomenon in man.

4. *Hematological Changes.*—Hemolysis is temperature dependent and is reduced during blood-

cooling. The use of smaller instruments for the low flow rate needed also aids in the prevention of hemolysis. The small amount of blood required to prime the instrument lessens the problem of

porarily reduced to unphysiologic levels. However, blood volume studies with radioactive iodinated albumen indicate that the entire volume of the less viscous, diluted blood is available for

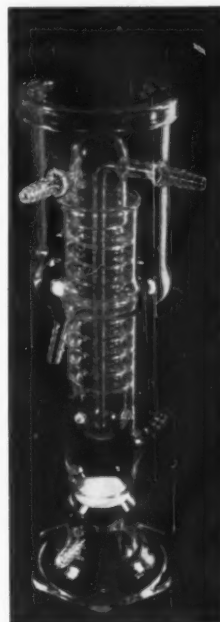
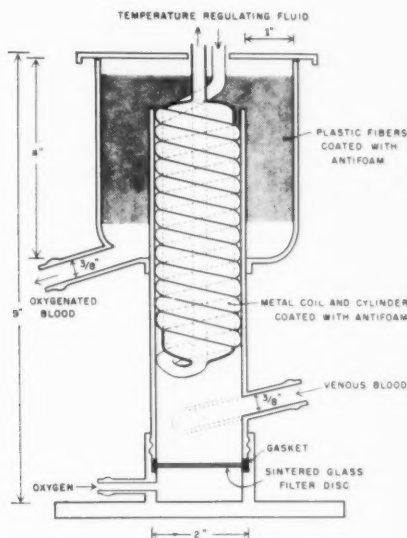


Fig. 7. Diagram of plastic (left) and photograph of glass (right) microbubble oxygenator with internal thermoregulator.

blood donations, transfusion reactions and viral infections. The blood does not have to be rewarmed before use if the pumping is started slowly.

White blood cells are reduced to about half and platelets to about one third of the normal value, but it is not known to what extent the "physiologic" reduction of these elements during hypothermia contributes to this effect. These changes are rapidly restored to normal by blood transfusions<sup>107</sup> except for a continuing drop of eosinophilic leukocytes.<sup>51</sup> Since there is no evidence of an effect on the pituitary-adrenal axis in this condition a purely speculative discussion of this point would be fruitless at present.

5. *Blood Dilution.*—At first thought the dilution of blood with Ringer's solution to a hematocrit of about 35 per cent would seem *a priori* to be an objectionable or even dangerous step since hemoglobin and plasma proteins are tem-

peratures reduced to unphysiologic levels. However, blood volume studies with radioactive iodinated albumen indicate that the entire volume of the less viscous, diluted blood is available for the artificial circulation, whereas, the highly viscous whole blood does not completely mix with the tracer during blood-cooling. After the perfusion no further changes in blood volume take place if the entire system is filled with whole blood and additional blood transfusions are contraindicated. Quite different conditions are encountered if the blood is diluted with Ringer's solution. While all the added fluid is available to the pump oxygenator during the perfusion, none of it remains available to the heart 15 minutes after the perfusion.<sup>50</sup> This rapid disappearance rate of Ringer's solution after the perfusion makes it possible to replace all the diluting fluid with fresh, coagulable blood. Due to the obvious complexity of fluid shifts during rewarming from the hypothermic state produced by cooling of diluted blood, hematocrit determinations are misleading. Blood volume determinations with tagged red cells and tagged albumin would be of great interest, but are impractical. The constant monitoring of arterial and venous pressure during the re-

warming period is the best criterion of circulating blood volume and the need for more blood transfusions.

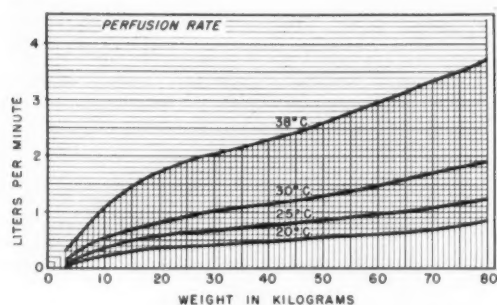


Fig. 8. Calculation of adequate perfusion rate at various body temperature.

6. *Electrolytes.*—Significant changes of the serum cations and anions do not occur after hypothermia by means of a pump oxygenator<sup>107</sup> and the legitimate question should be asked whether this is a desirable goal. French physiologists have shown that the constancy of the "milieu intérieur" is not ideally suited for the hypothermic heart and that a new "équilibre thermocationique" should take its place.<sup>94</sup> To achieve the optimal amplitude of contractions at lower temperatures the extra-cellular bath should contain less potassium and more calcium and magnesium. This finding is of phylogenetic interest because the serum of many lower animals contains an increased amount of magnesium while the animals are cold.<sup>90</sup>

7. *Rate of Flow.*—On the basis of the best available estimate for optimal rate of flow at normal body temperature<sup>12</sup> one can calculate the optimal flow rate at lower body temperature<sup>8</sup> from determinations of oxygen consumption and cardiac output during peripheral cooling. No information is available yet on the oxygen consumption of dogs with differential hypothermia by blood cooling, and therefore, the flow rates used represent empirical experience with survival of the animal as the only criterion. If one withdraws blood from both vena cava by a pump, one can circulate the cardiac output corresponding closely to the degree of immersion hypothermia; or at 30° C. one-half and at 25° C. one-third of the normal cardiac output is required to provide adequate perfusion. However, at times one can notice that over-oxygenation of the animal results, which is not harmful but may not be necessary.<sup>47</sup> If one withdraws blood by gravity

from one catheter only, the animal sets its own rate of flow at various temperatures (Fig. 9) which is much lower than the cardiac output of

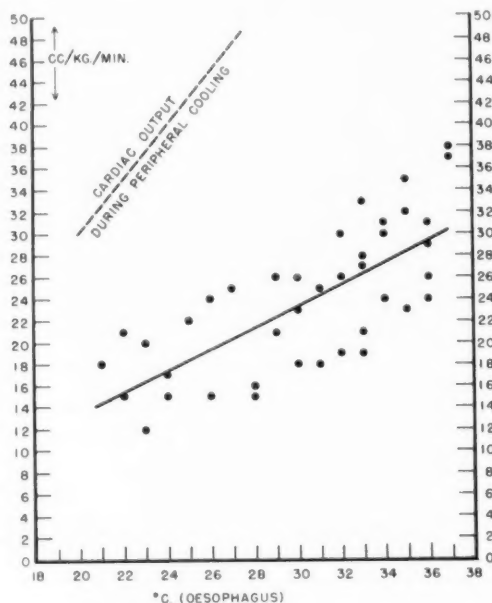


Fig. 9. Venous blood flow from one peripheral catheter during hypothermia by blood cooling. (Reproduced by courtesy of Charles C Thomas, Company, Springfield, Illinois.)

dogs during peripheral cooling. However, due to the differential cooling and perfusion of the organs which need the greatest protection, such low rates of flow are sufficient for about thirty minutes of cardiopulmonary by-pass. Higher flow rates can be achieved by an additional catheter and by adding Ringer's solution to the circulating blood volume.

8. *Temperature.*—Heymans observed the differences of temperature within the body by cooling the blood in a carotido-jugular shunt, but the temperature differences produced by cooling blood with a pump oxygenator are more pronounced since the flow rate does not depend on the animal's own circulation.<sup>89</sup> Temperature gradients of 20° C. (Fig. 10) between different parts of the body can be induced by the choice of various arteries and rate of flow.<sup>57</sup> Since the change of temperature of an organ depends directly on the rate of perfusion with cold blood, one can calculate the distribution of blood among the various

organs. Whereas, the fall of temperature is very rapid in the internal organs, it is very slow in the skin, subcutaneous tissue and muscle, indicating that brain, heart, liver and kidneys, or only 5 per cent of total body weight, receive about 60 per cent of total blood flow. Although the normal kidney blood flow is about four times greater than that of the heart or the brain per gram of tissue, the heart and the brain cool at about the same rate, which proves that among the internal organs the flow can be directed to favor the more vital organs.<sup>88</sup> Thus, cooling with a pump-oxygenator lowers rapidly the oxygen consumption of the vital internal organs by perfusing them with oxygenated blood, whereas, cooling by ice immersion lowers rapidly the oxygen consumption of the less vital periphery and causes a capillary perfusion deficit of the internal organs.

The difference between these two methods becomes even more marked and of far greater importance during rewarming. During peripheral rewarming the highly increased oxygen demand of the skin, subcutaneous tissue and the muscles, or of the major part of body weight, cannot be met by the decreased output of the too cold heart, which with the other internal organs still suffers from increased blood viscosity. Rewarming with a pump oxygenator rapidly raises the oxygen consumption of the heart and the internal organs by simultaneously and automatically covering their increased demand with sufficient oxygen and this results in an increased cardiac output first which then rewarms and oxygenates the less vital periphery. Furthermore, the end point of temperature of the heart is difficult to predict during external cooling since the temperature continues to drift in a variable manner, whereas the temperature of the heart can be accurately controlled by internal cooling at all times. Thus, these two techniques to induce hypothermia for cardiac surgery represent the opposite extremes: one creates pathologic disintegration, the other, physiologic integration.<sup>37,43</sup>

**9. Ventricular Fibrillation.**—During cardiopulmonary by-pass ventricular fibrillation has lost its deadly scare and is not more than a cosmetic defect of the electrocardiogram. It can be readily induced by an electric stimulus<sup>6,5</sup> to stop the pumping action of the heart and to avoid air embolism during left cardiomyotomies.<sup>105</sup> The operation completed, ventricular fibrillation can be

stopped with an electric shock or by injection of potassium chloride, followed by heart massage and calcium chloride to strengthen the contractions.<sup>24</sup>

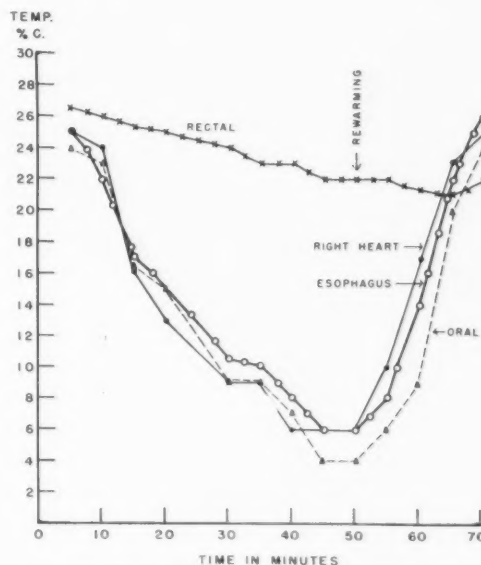


Fig. 10. Differential hypothermia by blood cooling. (Reproduced by courtesy of *American Journal of Physiology*.)

By cooling blood circulated through a pump oxygenator the usually observed hypothermic "injury currents," artio-ventricular blocks, auricular and ventricular fibrillation are not seen and hearts stop beating at about 13° C. (Fig. 11). Arrhythmias, like artio-ventricular block, occur during rewarming and in one experimental series two of eight dogs developed ventricular fibrillation. By an oversight, these two dogs had not received quinidine until cardiac arrest had occurred.<sup>113</sup> Since then, all animals were routinely pretreated with a slow drip of diluted quinidine (30 mg./kg.) given intravenously or into the instrument although it is realized that a study of the optimal coronary flow rate during rewarming may obviate this step. However, if the injury of ventriculotomy is added, it is always advisable to use quinidine because this neglected "miracle drug" prevents completely the 100 per cent incidence of ventricular fibrillation in hypothermic dogs subjected to coronary occlusion.<sup>108</sup> Ventricular fibrillation is a harmless condition during cardiopulmonary by-pass, but prevention is still better than treatment.

10. *Elective Cardiac Arrest.*—Except for the bronchial artery flow into the pulmonary veins, the heart during cardiopulmonary by-pass behaves like an isolated, perfused preparation<sup>76</sup> and

some of the debt he owes the physiologists of past generations by presenting their contemporary successors with a beautiful problem.

Extracorporeal cooling adds further advantages

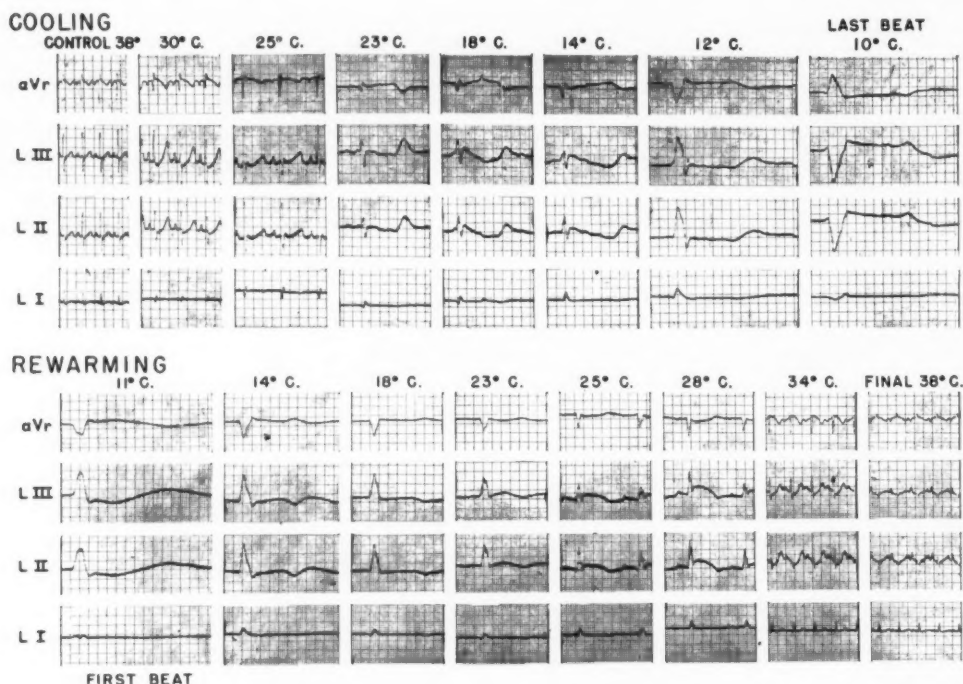


Fig. 11. Electrocardiogram in severe hypothermia by blood cooling. (Reproduced by courtesy of *American Journal of Physiology*.)

the great wealth of information gathered on all aspects of myocardial metabolism can now be applied by cardiac surgeons. The paralyzing effect of potassium,<sup>97</sup> the slowing effect of small amounts of the "vagus-stoff"<sup>98</sup> and the arresting effect in large concentrations of acetylcholine<sup>99</sup> have opened undreamed of vistas of all chambers of the heart.

One can assume that a heart which does not do any external work and does not even contract must have a low oxygen consumption to tolerate prolonged ischemia but no one expected that the carbohydrate energy production in the arrested heart would be only 1/2000 of that in the beating heart. It is even more surprising that the heart does not use lactic acid as the natural source of energy of anaerobic glycolysis<sup>68</sup> and thus, there exists the not unusual situation that the basic physiology of a useful clinical procedure is not understood. This way, the clinician pays off

to elective cardiac arrest. The optimal oxygenation of the heart before and after paralysis is made much safer. Due to the greater sensitivity of the hypothermic myocardium to potassium smaller amounts at a slower rate of injection are needed to produce arrest. The period of aortic occlusion can be further prolonged because the metabolism of the myocardium has been lowered before potassium stops the heart beat.<sup>55</sup> This observation may be useful in patients with arteriosclerotic heart disease. There is less danger of distending the paralyzed myocardium because the rate of blood flow can be further reduced. Lastly, the recovery of the hypothermic heart is faster, especially if potassium chloride is used instead of potassium citrate. The hypothermic heart recovers faster because the "step ladder" phenomenon, the amplitude of contractions and the production of energy are greater at 27° C. than at 37° C.<sup>81</sup> During perfusion of the heart with cold, oxygena-



ted blood this temperature optimum is shifted further downward and the most forceful contractions can be recorded at 22° C. (Fig. 12). This finding was due to serendipity, because the aim of the experiment was to measure myocardial oxygen tension during hypothermia and not amplitude of contractions. However, the platinum electrode inserted into the heart muscle is so sensitive to the stirring effect of the moving muscle fibers that one ends up with a reasonable facsimile of a mechanogram instead of a polarogram. This unfortunately invalidates the application of the best method to measure available oxygen of the intact heart<sup>46</sup> and one has to seek consolation in Thomas Henry Huxley's sigh: "The tragedy of science is the shattering bereavement of seeing a beautiful hypothesis slain by an ugly fact."

11. *Hypothermic Asystole.*—Prolonged left cardiomyotomies can also be performed when the heart beat is stopped below 13° C. by blood-cooling.<sup>50</sup> The heart can be kept in asystole as long as the temperature is kept that low. Experiments to determine the time limit have not been carried out yet. In a series of thirteen consecutive experiments it took about forty-five minutes to stop the heart by physical means only and after twenty minutes of blood rewarming the instrument could be turned off. The longest cardiomyotomy lasted forty-two minutes. The hypothermic heart in asystole is small and firm and the coronary flow can be kept so low that on many occasions the heart cavity had to be filled with saline to prevent air embolism on rewarming. Nine of these animals were normal long-term survivors and four died of postoperative complications like hemothorax, infection and thrombosis.

12. *Anoxic Tolerance of the Beating Heart.*—For prolonged visualization of the aortic valve to perform corrective surgery or to implant an eventual prosthesis in its proper place, the surgeon has to stop coronary flow to obtain a dry field and the heart should continue to beat to observe and test accurately the function of the valve. These appear to be the most exacting demands for intracardiac surgery because without coronary flow the anoxic heart cannot continue to beat.

Information on the anoxic tolerance of the by-passed canine heart is bound to be contradictory because of the many variables involved, like myo-

cardial oxygenation before aortic occlusion and bronchial artery flow into the pulmonary veins.<sup>9</sup> During extracorporeal circulation bronchial artery flow amounts to about 1 per cent of total arterial

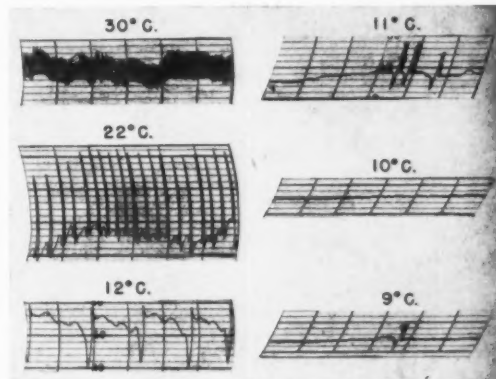


Fig. 12. Amplitude of ventricular contractions during hypothermia by blood cooling recorded polarographically with a platinum electrode. (Reproduced by courtesy of Charles C Thomas Company, Springfield, Illinois.)

flow, but increases with arterial and venous pressure or the use of carbon dioxide to ventilate the lungs and decreases with pulmonary deflation.<sup>9</sup> Within these limitations of standardization, the most reliable information indicates that after twenty-five minutes of anoxia the fibrillating heart of the dog cannot be resuscitated with uniform success.<sup>15</sup> Thus, aortic occlusion of the by-passed canine heart at normal temperature does not create the ideal requirements for exposure of the aortic valve, since the available time is too short for thorough exploration of the anatomy followed by most delicate plastic surgery and the fibrillating heart does not permit a functional evaluation of the corrected or substituted aortic valve.

In man, five minutes of complete myocardial ischemia during cardiopulmonary by-pass at normal temperature caused death due to myocardial necrosis in one case<sup>82</sup> and uneventful recovery after forty minutes in another.<sup>17</sup> It is evident that the varying conditions of the patient's myocardium makes this procedure an unpredictable one, to say the least.

It appears as if extracorporeal cooling may offer some advantages by minimizing the changes of myocardial ischemia on one hand and avoiding

the technical difficulties of retrograde coronary perfusion<sup>92</sup> on the other. The hypothermic and by-passed heart shows a remarkable resistance to total ischemia<sup>93</sup> and in quinidine pretreated dogs

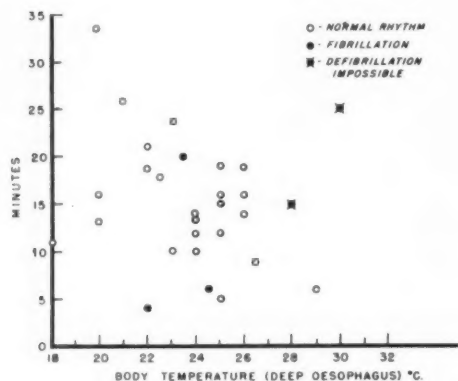


Fig. 13. Anoxic tolerance of beating hearts during hypothermia by blood-cooling. (Reproduced by courtesy of *Proceedings of the Society for Experimental Biology and Medicine*.)

normal rhythm of the heart can be observed after twenty-five minutes of aortic occlusion at 21° C.<sup>13</sup> This is not yet the end point of anoxic tolerance and such information for various temperatures, as well as metabolic studies are not yet available. During such prolonged periods of total ischemia the heart rate decreases in a linear fashion and the electrocardiogram shows frightening but reversible injury currents.<sup>45</sup> On removal of the aortic clamp the heart goes into arrest, which is probably due to release of potassium into the coronary vascular bed and after a minute of perfusion with oxygenated blood the heart starts to beat again. Such periods of coronary occlusion can be repeated if coronary perfusion of two minutes' duration supplies new energy to the heart and in one experiment the myocardium was subjected to three consecutive occlusions of twenty minutes at 24° C. without ill effect. One can envision that after corrective surgery of the aortic valve a constant flow of glucose solution into the left auricle may make visual evaluation of valvular function possible.

**13. Coronary Flow.**—It must have been a disappointing experience for cardiac surgeons who dreamed so long of the "bloodless heart" and labored so hard to perfect complicated machines

to that end, to see the operating field flooded again with the swollen rivers of coronary blood. Subsequent studies have shown that the oxygen consumption of a heart not performing any external work is only about one-third of normal,<sup>10</sup> but that the coronary flow still equals or even exceeds the normal level, in spite of subnormal body flow rates and blood pressure.<sup>92</sup> Thus, the heart finds itself suddenly in the Utopian dream of being underworked and overpaid. The surgeon, however, finds himself in a less enviable reality, because he has to cope with a large flow of blood where he expects and needs it the least. One might think that a reduction of total flow would make this coronary tide retreat, but unfortunately the exact opposite results because hypoxia always is followed by an enormous increase in coronary flow.<sup>28</sup>

Studies on coronary flow during extracorporeal cooling at varying temperatures and flow rates have not been conducted yet, and therefore, it is not known whether a reduction in total flow rate would also be followed by an increase in coronary flow, if the hypoxic vasodilatation would be diminished. But if arterial pressure and total blood flow are kept at a relatively high level, coronary flow rates result which are at least three times higher than the ones which correspond to the same body temperature by peripheral cooling.<sup>57</sup> This is probably due to the fact that the periods of coronary flow cessation during ventricular systole become less frequent, whereas, the periods of coronary inflow during diastole become increasingly longer. As long as the contractions increase in force the heart can handle this "embarras de richesse," but below 22° C. the heart becomes progressively unable to eject the excessive coronary flow and severe dilatation with irreversible myocardial failure results. This overstretching of the myocardium during profound hypothermia by blood-cooling can be prevented by perfusing the cerebral and the systemic circulation at different rates of flow, or much simpler, by partial obstruction of the ascending aorta with a screw clamp of the Goldblatt type (Fig. 14). Then the systemic flow rate can be kept high, whereas, the coronary flow can be controlled and reduced to a mere trickle. It may be that this procedure could be of advantage in correction of mitral valvular disease, since the minimal coronary perfusion of the beating heart would not only permit direct vision surgery, but

also direct vision testing of function. To test the competence of an implanted mitral valve prosthesis one can fill the left ventricle by continuous flow of glucose solution and observe the movements of

Under these conditions, oxygen is one of the few good things one cannot overdo.

Another observation of general biologic interest can be made. As the temperature falls the amount

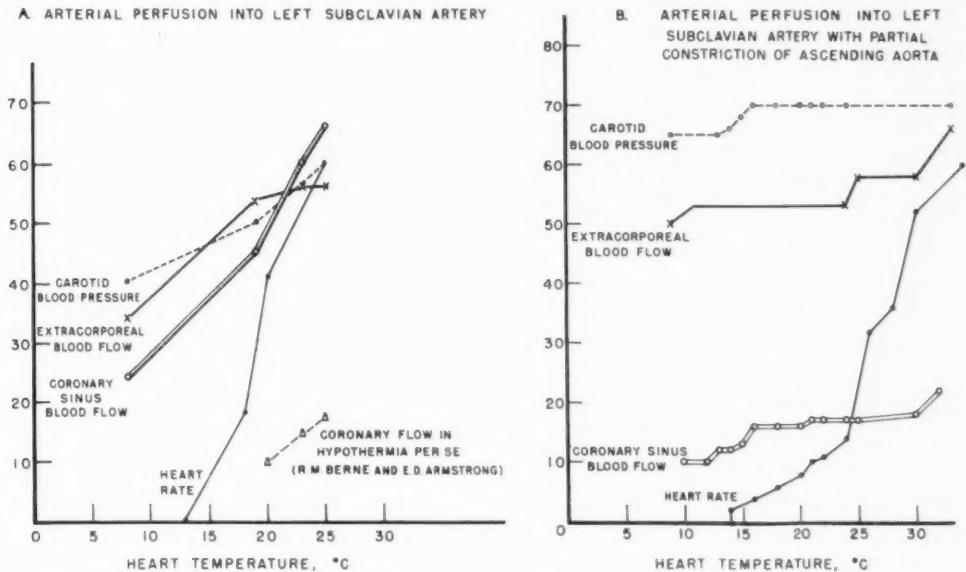


Fig. 14. Reduction of coronary flow by partial constriction of ascending aorta during hypothermia by blood-cooling. (Reproduced by courtesy of *American Journal of Physiology*.)

the plastic valve. Although it is not too difficult to design a competent flap valve, long-term survival has not been achieved yet because sooner or later all dogs die of fibrin or bacterial embolism.<sup>44</sup>

**14. Gas Exchange.**—If one avoids dilatation of the hypothermic heart in asystole by a drastic reduction of coronary flow with a screw clamp on the ascending aorta, one can test the effect of extreme overoxygenation of the rest of the body. With an oxygen consumption of only about one tenth of normal<sup>45</sup> and an almost normal oxygen supply from the instrument, the arteriovenous differences in oxygen and carbon dioxide content can be made to disappear, or one deals with an animal without any venous blood. The venous oxygen tension rises above the arterial oxygen tension of a person breathing air (Fig. 15) and although such a condition is highly unphysiologic, no deleterious effects have been observed in the surviving animals. The conclusion is inevitable, that all dangers during total body perfusion are caused by a lack of oxygen, and not by a surplus.

of physically dissolved oxygen in the water of the plasma rises until it reaches ten times its normal value (Fig. 16). Since at such low temperatures oxygen hardly dissociates from hemoglobin, one can wash out all the red cells from the circulating blood and substitute plasma for it. With a high flow rate the life of such animals can be maintained without hemoglobin, if all the red cells are returned before rewarming.<sup>52</sup> Explorers of the frigid Antarctic Ocean discovered that the blood of the "ice fish," whose scientific name is *Channichthys*, does not contain any red cells, but that white cells constitute about 1 per cent of its volume. The plasma has about the same oxygen absorbing capacity as human plasma and contains only traces of iron. These weird, transparent creatures, which are almost 2 feet long and weigh about 3 pounds, live without blood pigment and by the absorption of the high oxygen content in the extremely cold water only. For a short period dogs can be made to live like ice fish, and the obvious question arises: *What has this fish story to do with cardiac surgery?* It provides some in-

formation on the greater margin of safety in case of severe blood loss during extracorporeal cooling, since such an experiment drives hemorrhagic shock to its final extreme.

of the circulation without the aid of mechanical devices. On the other hand, the development of efficient pump oxygenators has progressed with such breathtaking speed that the need to lower

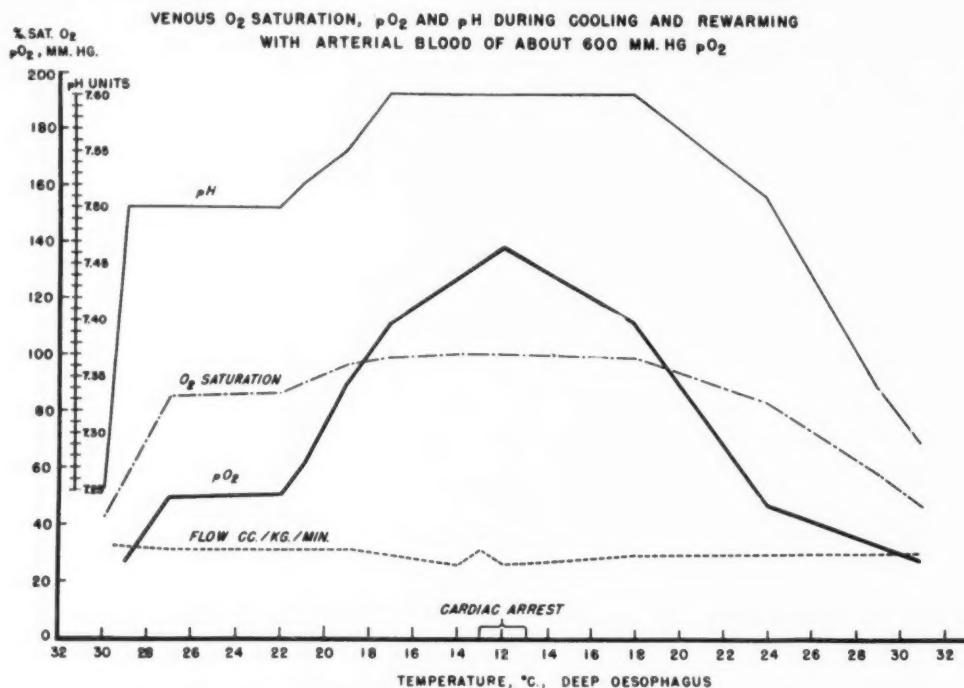


Fig. 15. Venous  $O_2$  saturation,  $O_2$  tension and pH during blood-cooling and rewarming with constant flow of arterial blood of about 600 mm. Hg.  $O_2$  tension.

15. *Pulmonary Ventilation.*—One word has to be said about this subject because it can ruin any experiment with extracorporeal cooling. Overinflation of the lungs, especially with oxygen, should be avoided, because it produces invariably massive pulmonary edema. This may indicate that oxygen poisoning by inhalation and by blood perfusion require different conditions, but the mechanism of this phenomenon is not known.

### Outlook

Only an actual need will decide whether any of the experimental studies on hypothermia, extracorporeal circulation and extracorporeal cooling will ever be transferred from the laboratory to the operating room. The beneficial effect of carbon dioxide and of various drugs on hypothermia certainly require intensive study because a condition of real artificial hibernation in man might be produced which would permit prolonged cessation

body temperature may not arise again. Therefore, the following attempt to assign a place for extracorporeal cooling within the present scene should be considered a physiologic meditation rather than a practical suggestion. It is based on a much humbler philosophy since it does not assume *a priori* that man can imitate nature's perfect creation of hibernation or of cardiopulmonary function.

Whereas, during total body perfusion at normal temperature, the rate of flow has to match the inflexible oxygen consumption, during extracorporeal cooling one can adjust the oxygen consumption to the available flow. Instead of the rigid requirement of a high flow rate at normal metabolic level, one gains two variables and can vary both at will. Since the venous cannulae have to be smaller than the vena cava and the arterial cannula smaller than the aorta, it is evident that at times it may prove difficult to circulate the

normal cardiac output or about half of the patient's blood volume. If one falls short of this goal, one can lower the temperature until the mixed venous blood has again a normal oxygen saturation. Thus, neither the optimal rate of flow nor the temperature depend on theoretic considerations, on the formulation of catchy slogans and "principles," on the consensus of opinion of leading authorities in the field, on the official stamp of approval of organizations or on the statistical averages of the last 500 cases, but on the actual conditions encountered at any time during the perfusion. Almost 100 years ago Claude Bernard wrote:

If we collect a man's urine during twenty-four hours and mix all this urine to analyze the average, we get the analysis of a urine which simply does not exist; for urine, when fasting, is different from urine during digestion. A startling instance of this kind was invented by a physiologist who took urine from a railroad station urinal where people of all nations passed, and who believed he could present an analysis of the average European urine. If we study complex and variable conditions, averages must be rejected, because they confuse, while aiming to unify and distort while aiming to simplify.

Thus, the choice of an initial level of oxygen consumption or the proper supply of oxygenated blood should be a highly individualized one, depending on the estimated duration and anoxic tolerance in the particular case, and the rate of flow a particular instrument can handle comfortably. Surgeons with less experience in small hospitals may be safer if they choose a lower body temperature because they may gain a wider margin of safety in case of technical errors, accidents, hemorrhage and infections. If the instrument, which is also designed, built and operated by fallible humans, should not perform as expected, there may be more time to overcome a technical difficulty. With the greater simplicity and safety of total body perfusion the surgeon may not have to hire so many extras for a spectacular mob scene in his operating room, but may be able to communicate with his few trusted assistants and nurses without the use of intercommunication systems or closed circuit television. Soon he will probably find out that the electroencephalogram is hard to interpret during hypothermia and he will return the instrument to the neurologist. After some time he may learn that the reflected light on his retina is about as reliable and rapid

an indicator of venous oxygen saturation as the transmitted light in the photocell and if the venous blood in the inflow line looks almost as "good" as the oxygenated blood in the outflow line, he may

#### OXYGEN CONSUMPTION AND OXYGEN SUPPLY IN SEVERE HYPOTHERMIA WITH PUMP-OXYGENATOR

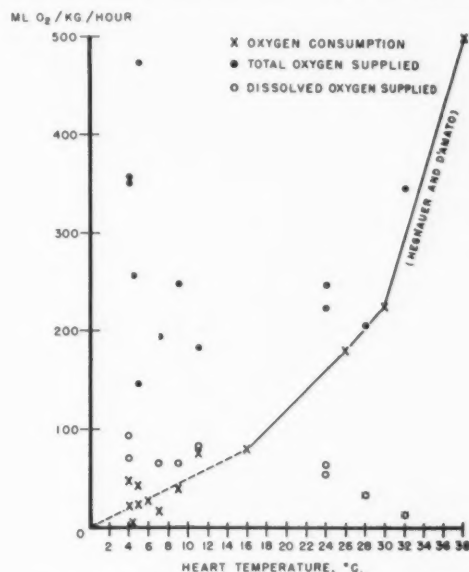


Fig. 16. Oxygen consumption and oxygen supply in severe hypothermia by blood cooling. (Reproduced by courtesy of National Academy of Sciences—National Research Council.)

feel safe enough to return the entire technical exhibit of flow meters, oximeters, pH meters, carbon dioxide analyzers and polarimeters to the clinical physiologist. To his great surprise he may even gain so much self-confidence to trust his own ability in building little gadgets in the machine shop, in making some interesting observations in the laboratory and applying it in a slightly new way in the operating room, instead of waiting for the last word of the gospel caught at the yearly mass pilgrimage to the holy places of cardiac surgery.

Stripped of the awe-inspiring and intimidating complexity of the heart machine age with controls and monitoring devices resembling the dashboard of an atomic submarine and relieved of the delayed and noncommittal reaction of interdisciplinary by-standers, he may make the greatest discovery of all, that he does not have to be a world-renowned heart surgeon to operate inside



the heart, but just a good doctor who can recognize "cyanotic" blood and low blood pressure when he sees them and who has the technical skill to repair a hernia.

On that day he will have found himself again and while scrubbing with his assistant for the next operation he may say: "You know, this thing is not bigger than both of us." Just like the lonely sheriff in the Western movie, he will then be able to face emergencies all by himself. He will have the enthusiasm and equanimity to sustain him through failure and success, and when he has to lay down the scalpel without having received academic honors or public acclaim, he still will be able to say with Laennec:

I shall consider ample, yea more than sufficient reward for my labors, if it should prove the means by which a single human being is snatched from untimely death.

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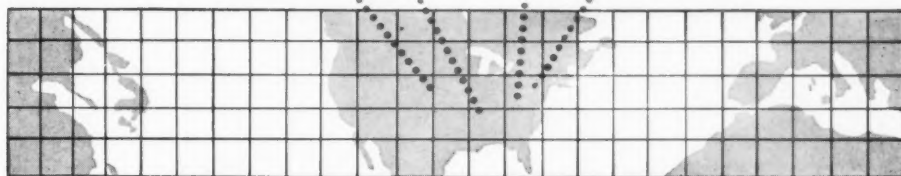
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# The Present Status of Arterial Substitutes

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IN the search for the best substitute for the replacement of arterial segments many problems remain unsolved. Nevertheless, the experimental findings and clinical observations during the last five years have contributed a sufficient amount of positive knowledge to enable one to form reliable judgments with respect to the value of the various types of substitutes that have seen clinical application in the recent past. As a result of the late follow-up studies for instance, serious doubt has been cast on the suitability of arterial homografts for general use in reconstructive vascular surgery. Furthermore, after many experimental trials very promising clinical results have emerged with the use of tubes woven from plastic yarn of a variety of types. It seems timely, therefore, to assess our experimental and clinical experiences and try to assign these arterial substitutes their respective roles of usefulness. We shall attempt to discuss in this fashion the merits of arterial substitutes of animal origin (venous and arterial homografts and heterografts) and of prostheses made from teflon, nylon and dacron yarn.

*Venous autografts.*—Our own experience with venous grafts has been too scanty to allow the formulation of judgment. The most extensive experience with this type of implant was reported by Julian,<sup>1-4</sup> and his results in general were satisfactory both with saphenous and femoral venous autografts for follow-up periods of up to seven years. Grafts of this type have, of course, severe limitations as to usable size and diameter which are determined by the dimensions of the only commonly available sources: the saphenous and superficial femoral veins. The most advantageous field of application of an autogenous vein graft is in the replacement of relatively short segments of peripheral arteries; need for such applications are particularly prone to arise in cases of traumatic

injury. The satisfactory behavior of autogenous venous implants is, no doubt, dependent upon the acceptance of autogenous tissues by the host—a biological phenomenon of almost universal validity.

*Venous homografts.*—This advantage (biological acceptance) is not present when homologous vein grafts are used. The lasting qualities of such transplants are, therefore, poor. They also display other disadvantages, the most serious being the problem of the lack of availability of appropriate sizes. In general, the clinical use of homologous vein grafts has little attraction and has been largely abandoned.

*Arterial heterografts.*—Our own experimental observations on arterial heterografts using the McCune preparation were in accord with the majority of findings recorded in the literature.<sup>6</sup> About one-half of these implants remained functional for up to one year and some of these retained a fairly good degree of structural integrity for up to four years; one-third underwent severe and rapid enough degenerative changes to rupture in a few weeks; the remainder developed structural deterioration of a degree that was incompatible with continued function. The performance of these grafts is entirely too unpredictable to warrant their clinical use.

*Arterial homografts.*—Our observations on the biologic fate of arterial homografts (reported about two years ago) were based on the study of 268 cases of angioplastic operations in which homologous grafts had been used.<sup>5</sup> In 150 of these cases serial postoperative angiographic examinations were carried out and in twenty-three cases in which late failure occurred or in which the patient died the grafts were recovered and investigated histologically. Approximately one-fourth of the aortic bifurcation grafts showed significant changes in the angiogram, and in the femoral grafts intrinsic defects were observed in about one-half the cases. These changes consisted of intimal ulcerations,

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dilatation and tortuosity of the wall, and rarely in aneurysm formation. Although the incidence of changes was highest in the femoral homografts, the most disturbing findings were the three



Fig. 1. An elastic Dacron prosthesis following six months of dog implantation in the McCune preparation. Arteriogenesis is satisfactory with a well formed pseudointima seen lining the opened graft.

aneurysms that developed in the series of fifty-five aortic grafts. In one case, because of the progressive enlargement, it was necessary to resect the aneurysm and replace it with a plastic prosthesis.

The histologic findings afforded a logical explanation for the deterioration of the grafts seen in the angiograms. From these findings it became evident that, contrary to some widely held beliefs, an arterial homograft is not actively accepted and incorporated by the host tissues. Reinforcement of the homologous implants by host connective tissue is at best scanty and, in fact, the implant occasionally is actively rejected by the host. This host-graft

reaction is undoubtedly governed by immunologic factors. The implanted graft in most instances must maintain its structural integrity through the mechanical strength of its histological elements. When these wear out, as they inevitably do in time, the graft wall weakens, becomes dilated and eventually is occluded by thrombosis or, rarely, ruptures. The histologic element essential for mechanical integrity is the elastic component in the arterial wall. This is why aortic grafts, very rich in the elastic element, have a much longer useful life.

Thus, in spite of the excellence of their technical qualities and the brilliant early results usually encountered in their use, both the human aorta and the human femoral artery suffer from serious deficiencies when used as homologous arterial substitutes. The femoral artery in particular seems intrinsically poorly suited to serve in this role.

*Plastic substitutes.*—Even before our apprehension concerning the ultimate fate of homologous arterial implants was found to be justified, we undertook a series of experimental studies on the replacement of long and narrow arterial segments with seamless plastic tubes.\* The experimental preparation used in this study was similar to that described by McCune which consists of an exclusion of the thoraco-abdominal aorta in the dog utilizing an end-to-end anastomosis with the proximal thoracic aorta and a distal end-to-side anastomosis just above the abdominal aortic trifurcation. This preparation enables one to study various types of arterial substitutes in lengths and diameters comparable to those used for angioplastic procedures in diseased human femoral arteries. These experimental conditions are far more realistic than those in short-segment aortic replacements that have been commonly used.

In this manner seamless tubes woven from nylon, orlon and teflon were tested.<sup>6</sup> During observation periods up to two years these implants gave a good rate of patency and showed satisfactory arteriogenesis, that is, formation of pseudointima and ingrowth of host connective tissue into the fabric to create a new connective tissue tube. There was, however, a disturbing observation made in all these inelastic prostheses, namely, that kinking occurred whenever the plastic tube was bent, and this was followed by thrombosis. This deficiency has

\*Support for this research was in part by a grant from the Michigan Heart Association.

rendered all such inelastic plastic prostheses unsuitable for use except in the replacement of very short straight segments or bifurcations with very short limbs.

tubes unsuitable as arterial synthetic devices except perhaps in the femoral region.

About fourteen months ago it became feasible to apply the "Helanca" process to Dacron† fibers, and

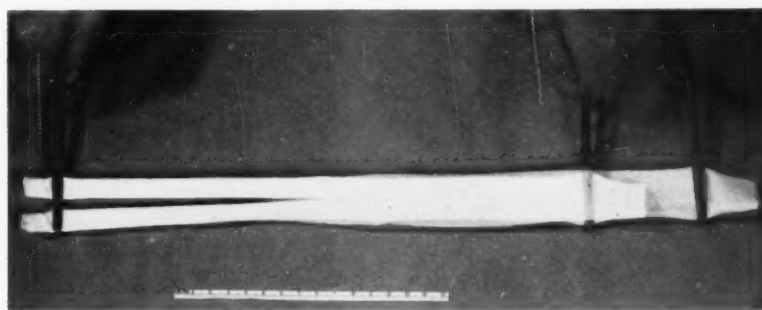


Fig. 2. A double exposure photograph of an elastic Dacron bifurcation prosthesis showing the range of stretch of the fabric. (The ruler illustrated measures  $15\frac{1}{2}$  cm.)

We attempted to overcome the disadvantages of the rigidity of plastic prostheses by constructing tubes from specially treated yarn. Two years ago, when this phase of the work began, the only plastic yarn with elastic qualities was one made of nylon and treated with the "Helanca" process.<sup>7</sup> In this patented process the nylon fiber is twisted into a tight spiral and then this twist is heat-set at  $270^{\circ}$  F. Two plies with opposite twists are combined to make the final yarn. When unstretched, the yarn is curly or kinky but when under tension, the twisted fibers uncurl and elongate. This imparts to the yarn a quality of elasticity. The fabric of the prosthesis has a simple taffeta weave. The warp, which is in the length-wise direction of the tube, contains elastic yarn. The woof, which lies in the transverse direction of the tube, contains untreated or plain yarn. The mesh size is about 0.1 mm. or 100 microns. Such an elastic prosthesis has readily overcome the problem of kinking. In spite of being implanted in a markedly tortuous course, these tubes remained open and functioned as satisfactorily as the straight tubes. Arterio-genesis was very satisfactory; however, tensile strength determinations of the nylon implant revealed a significant and a progressive decrease. In two months 80 per cent of the original tensile strength had been lost. This deterioration of nylon implants is the result of their tissue reactivity which in turn is due to the water-absorbent property of the nylon. This lack of durability makes nylon

TABLE I. RESULTS OF ELASTIC DACRON GRAFTING PROCEDURES  
May 1957—April 1958

	Immediate		Late	
	Open	Closed	Open	Closed
Aorto-iliac	30 91%	3 9%	30 91%	3 9%
Femoro-popliteal	23 82%	5 18%	20 72%	8 28%
Total	53 87%	8 13%	50 82%	11 18%

seamless straight and bifurcation tubes were constructed from yarn made up of fibers so treated. In a series of dogs, in preparations identical with those described for nylon prostheses, the elastic Dacron tubes proved to be equally satisfactory from the points of view of patency rates and arterio-genesis; but, in marked contrast, they showed no loss of tensile strength up to twelve months following implantation.

The results of these animal experiments justified clinical trial. During the past twelve months we have used elastic Dacron prostheses as aorto-iliac replacements, as unilateral and bilateral aorto-femoral bypasses, and as femoro-femoral and femoro-popliteal bypasses. Most of the operations in the limb were long bypasses from common femoral artery to distal popliteal artery varying in

†"Dacron" is the trade name of E. I. du Pont de Nemours and Co., Inc., for their polyester fiber.



length from 31 cm. to 57 cm. and averaging 46 cm. The results in sixty-one cases using various types of elastic Dacron prostheses is shown in Table I. The late cumulative patency rate of 82

have been shown to be completely unreliable. Both venous and arterial homografts, because of their lack of durability, should be limited to the occasional instance where the technical difficulties

TABLE II. PROPERTIES OF ARTERIAL SUBSTITUTES STUDIED

	Tissue Acceptance	Ease of Handling	Durability	Elasticity	Availability	Recommended Use
Aorto-iliac homograft	Fair	Excellent	Fair	Excellent	Good	When anastomosis to visceral branches is needed
Femoral homograft	Fair-Poor	Excellent	Poor	Excellent	Poor	Technical difficulty (rare)
Teflon (non-elastic)	Excellent	Fair	Excellent	Poor	Excellent	A-I replacement with short limbs
Dacron (elastic)	Excellent	Good	Excellent	Good	Excellent	First choice for A-I and femoral replacement
Nylon (elastic)	Good	Good	Fair	Good	Excellent	Second choice for femoral replacement

per cent is only slightly inferior to that we obtained with homografts during a comparable follow-up period. It is hoped, on the basis of experimental and theoretical considerations, that the later results will be superior to those of homografts.

We have in general been well pleased with this prosthesis; however, it does have some disadvantages. The Dacron fibers are prone to slip, thus creating a small defect in the prosthesis which does not weaken it but may cause troublesome bleeding at the time of insertion. This difficulty may be largely overcome by gaining experience in the handling of such a prosthesis. The technique required is considerably more demanding than for suturing a homograft. It would be highly advisable for a surgeon planning to use such a prosthesis in a patient to familiarize himself with the technical problems in the animal laboratory.

Our criteria for the selection of suitable arterial substitutes for clinical use (based upon the experimental observations and clinical results briefly described above) are summarized in Table II.

#### Summary and Conclusions

As yet no truly ideal arterial substitute has been developed. Further investigation and clinical trial will be necessary before this goal is achieved. Autogenous vein grafts are readily available, especially in emergency circumstances, but are limited as to their dimensions. Experimentally, heterografts

in the case require their superior ability to remain patent under adverse conditions or in older individuals where the need for long-range function is not great. All the rigid synthetic plastic prostheses suffer from the disadvantage of kinking when bent, making their clinical usefulness quite limited. Elastic nylon tubes satisfactorily overcome the problem of kinking but show progressive deterioration of tensile strength which drastically limits their clinical application. In almost all instances we have found an elastic Dacron prosthesis to function very satisfactorily without loss of tensile strength, and we feel that this is the most suitable type of arterial substitute at the present time.

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# Aneurysms of the Popliteal Space

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THE scarcity of reported material in the literature dealing with popliteal aneurysm should not embrace the thought that this lesion is of little importance and may not be on the increase. The true non-military and non-traumatic popliteal aneurysm is chiefly of atherosclerotic origin and with the ever-increasing population in the older age group we must be on the alert for this vascular condition, which is considered by many as second only to aortic aneurysms in frequency<sup>3</sup> and may be found in younger individuals.<sup>3</sup> Certainly this condition should become easier to diagnose and to cure by direct surgical measures. Of the number of aneurysms reported in the literature well over 25 per cent are of the popliteal artery.

The two most common causes of popliteal aneurysms are atheromatous blood vessel changes and trauma. The latter are more common among military combat personnel owing to gun shot or penetrating wounds in the popliteal space which many times result in the formation of a false aneurysm; and these ordinarily have a higher morbidity than surgically-treated, elective cases because of extensive local tissue damage, hemorrhage and destruction of collateral blood vessels. Automobile accidents, fractures and bony growths<sup>9</sup> may be forerunners of aneurysms.

False aneurysms<sup>1</sup> or arteriovenous fistulas with aneurysmal formation are possibilities. Holman<sup>4</sup> demonstrated mechanically that a pulsatile jet of fluid through a narrowed area could produce a dilatation distal to the constriction by tissue fatigue. Micotic causes are given little credit for this type of aneurysm. Syphilis was responsible for a larger number of the early reported cases. This is borne out in cases reported from The Massachusetts' General Hospital by Robert L. Linton between the years 1908 to 1947: 1908 to 1917—four patients all luetic, 1918 to 1927—four patients, with one being arteriosclerotic and three luetic, 1928 to 1937—nine patients with four luetic and

five arteriosclerotic, 1938 to 1947—twenty-five patients all with arteriosclerotic changes.

A break in the wall of an atheromatous vessel with dilatation of the remaining intact layer is the main etiologic factor in the production of most popliteal aneurysms. Perhaps the wide range and frequency of motion at the knee joint accounts for many of the fractures in heavily calcified popliteal arteries. An estimate that 45 per cent of the patients will have bilateral involvement has been given by the Mayo Clinic<sup>2</sup> study of 100 popliteal aneurysms in that center from 1913 to 1951. These usually are spontaneous in beginning and may be rapid or slow in development.

Diagnosis may be missed by inadequate examination of the popliteal space. Also the area is difficult for the patient to see and may be asymptomatic for a long time. Pain from perivascular nerve pressure or a swelling with or without pulsations may be noted by the patient. In the absence of pulsations or bruit, the swelling may be mistaken for a Baker's cyst or a similar popliteal condition. X-ray<sup>10</sup> is valuable since frequently it will show the calcified outline of the aneurysmal sacculization; however, many are not diagnosed until a serious complication has developed.

The behavior pattern of this lesion is most unpredictable. Lord<sup>8</sup> correctly likens it to a vixen because of the slyness in its apparent benignity. It may develop suddenly or slowly; increase in the amount of dilatation can be extremely rapid or require several years for advanced arterial wall degenerative changes to cause weakness. It may be painful or completely asymptomatic. Thrombosis of the aneurysm, emboli to distal vessels, obstruction to collateral vessels or rupture of the sac may result in loss of foot or leg from gangrene and death of the individual may follow closely any of the above complications.

All popliteal aneurysms are sinister harbingers of sudden catastrophe, and each case deserves individual consideration. Any delay in treatment

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# ANEURYSMS OF THE POPLITEAL SPACE—COLE

may result in tragedy. With few exceptions of extremely poor risk patients all uncomplicated cases should be treated surgically as soon as preparations can be arranged, and all complicated

tion above and below the sac, then evacuating the contents. Philagrius of Macedon was first to extirpate the aneurysm. Guillemeau advised filling the sac with lint after ligation above and below.



Fig. 1. (a) Intact aneurysm from left leg. (b) Aneurysm from left leg opened.  
Fig. 2. (a) Intact aneurysm from right leg. (b) Aneurysm from right leg opened.

cases should be considered emergencies. Conservative treatment results in a high percentage of complications and loss of limb and life.

Of seventy-three cases treated non-surgically at the Mayo Clinic,<sup>2</sup> thirty-three had subsequent complications and sixteen ultimately required amputation, while twenty-four receiving primary surgical treatment suffered no further complications. Surgical approach for the cure of popliteal aneurysm dates back to the third and fourth century when Antyllus and Treves developed a method of liga-

Anel, in the sixteenth century, ligated the sac and left it unopened. There was very little change in surgical treatment until in the twentieth century, Matas developed his method of endoaneurysmorrhaphy which is still considered a satisfactory procedure. All of the above methods carried a fairly high percentage of distal gangrene. In 1931, Mulvihill and Harvey developed sympathetic ganglionectomy with beneficial effect to the extremity after acute arterial occlusion and Bird in 1935 combined this procedure with endoaneurys-

morrhaphy in a case of popliteal aneurysm with added benefit. This combination has since been used frequently by others. Linton<sup>7</sup> reported four-teen arteriosclerotic cases treated with preliminary sympathectomy then extirpation with excellent results.

In the individual who has had time to develop improved collateral circulation (and many have), simple above and below ligation and extirpation may give satisfactory results. Lumbar<sup>5</sup> sympathectomy should enhance the circulation distally and, where conditions permit, the continuity of circulation to the lower limb can be preserved or restored by interposing one of the various types of grafts<sup>6</sup> between the arterial segments. These usually give excellent results when properly inserted. Choice of surgical approach will be influenced by the condition and age of the patient, adequacy of collateral channels, degree of vascular degenerative change present locally and distally and the tissue vitality of the involved extremity. A case of bilateral popliteal aneurysm treated by above and below ligation and extirpation without benefit of graft or sympathectomy is reported as follows.

#### Report of Case

A. W., a white man, aged seventy-two, a carpenter by trade, was admitted to Highland Park General Hospital, June 22, 1956, with the following history. He had first noticed a swelling in the left popliteal space three weeks before admission and it had doubled in size during the previous two weeks. He also noticed that a similar but smaller swelling had presented in the right popliteal space within the immediate past ten days. On examination bilateral pulsating, lobular, painless enlargements without bruit were noted. There were good distal pulsations with normal color and temperature of the feet. Moderate edema and large varicosities were present bilaterally. He had been in the hospital two months earlier for surgical repair of a large hydrocele and hernia without recognition of the aneurysms. X-ray revealed extensive calcification of the pelvic vessels, femoral arteries and their branches and the break in the atheromatous wall of the aneurysmal sacs.

Laboratory data and physical findings were within satisfactory limits (both two months previous and at this admission). Arrangements for immediate surgery were quickly set up and the left aneurysm was removed within five hours after admission and the right one, thirteen days later.

Temporary compression of the artery during dissection of the sac and ligation of its tributaries supplied a valuable and fairly reliable test for unfavorable tissue changes which might follow primary ligation and extirpation. The pedal pulsations, while decreased in volume, were still perceptible and the feet (though somewhat cooler and paler) appeared to have sufficient viability. There-

fore, the procedure of ligation and extirpation of the aneurysms with preservation of the popliteal veins was carried out. Figures 1 and 2 show the size of the resected aneurysms. Continuous caudal drip of 1 per cent Xylocaine at the rate of 15 cc. every two hours was used for five days following surgery.

Postoperative observations were as follows: feet cooler and paler with some increase in lower leg edema, numbness and tingling of the toes, crampy pains in calf muscles on walking down the hall, moderate rubra of feet when dependent and a traumatic peroneal nerve left foot drop, which completely healed.

Since discharge his improvement has been sufficiently progressive that he returned to light carpentry work and by not hurrying can walk several blocks without halting claudication pain. He is satisfied and refuses further surgery.

The addition of either a graft or lumbar sympathectomy or both at the time of surgery would perhaps be considered the procedure of choice by some; however, it is my opinion that this elderly man has avoided an almost sure catastrophic complication should conservative treatment have been pursued. Surely, many more popliteal aneurysms will be found if this area, in the examination of the older patients, is given special consideration.

#### Summary

1. With increasing numbers in the older age group the arteriosclerotic type of popliteal aneurysm will be more prevalent.
2. A more careful physical examination is imperative.
3. Conservative treatment will have a high percentage of serious complications.
4. Without surgical management there is serious threat to the extremity and life of the patient.
5. The popliteal space is easily accessible to surgical approach.
6. Grafts and sympathectomy give added benefits and should be considered in all cases.

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(Continued on Page 98)

# Bilateral Internal Mammary Artery Ligation in Coronary Artery Disease

## Clinical Report of Thirty Cases

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THE purpose of this paper is to discuss the basic physiology and anatomy and to critically evaluate the clinical results of bilateral internal mammary artery ligation and division.

Several years ago a group of three Italian doctors<sup>5,6</sup> developed a new and simple method of treating coronary insufficiency by ligating the internal mammary arteries. Beneficial results from this operation were reported as high as 80 per cent.

Glover,<sup>1</sup> in November, 1957, was the first in this country to report on a series of seventy-seven patients treated with bilateral ligation and division. Postoperatively, 68 to 70 per cent of his patients were either free of angina or greatly improved. No significant change occurred in the remaining 30 per cent. Of the seventy-seven patients, five died one hour to fifteen days postoperatively.

Ripstein and his group<sup>2</sup> have operated upon a number of patients with coronary insufficiency and angina. However, their operation consisted of bilateral incisions over the second interspace without ligation and division of the internal mammary arteries. In other words a "sham operation" was performed. Postoperatively, 50 per cent of these patients were free of pain and greatly improved. From the respective studies of Glover, Ripstein and others, the psychic element involved in coronary artery disease as far as symptomatology is concerned appears to have a definite importance in the reported results of the operation. The physiologic and anatomic explanation of the operation, according to Griffin and associates,<sup>3</sup> is to

decrease the volume flow of blood to the internal mammary vascular bed, thus increasing the perfusion rate through the minute collateral circulation at the base of the heart. However, it must be noted that the results were recorded in the acute stages of the experiment. Further studies in the long-term chronically ligated animals are necessary in order to accurately determine the stability of the postligation increase in the perfusion rate.

A word or two about the gross anatomical types of coronary artery disease. Eighty per cent of the hearts examined at necropsy of patients with a known history of coronary artery disease with angina have the diffuse stenosing type of occlusive disease. Twelve per cent have the multiple segmental occlusive type with 50 per cent of these patients having had a previous history of angina. The remaining 8 per cent have the single solitary type of segmental occlusion without a history of angina.

The operation described by the Italian investigators and by Glover in this country is a simple surgical procedure. The simplicity and innocuous nature of this operation has greatly appealed to our non-surgical colleagues, the internist and to the patient.

The majority of the cases have been done under local anesthesia. Two small vertical incisions, 5 cm. in length, are made 2 cm. from the lateral borders of the sternum over the second interspace. The pectoralis muscles are split and retracted. The intercostal muscles are incised midway between and parallel to the ribs. The internal mammary arteries are then isolated, ligated and divided between the ligatures.

In our series of thirty cases, three of the patients were operated upon under general anesthesia. The remaining twenty-seven patients were treated under local anesthesia. Our patients were divided into two groups:

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- I. The acute post-myocardial infarction group.
- II. The patients with an established diagnosis of coronary artery disease with angina.

**Results in Group I.**—Five patients, between the ages of thirty and fifty-five, were operated upon from one to fifteen days after their acute myocardial infarction:

1. No postoperative deaths.
2. Early stabilization of the electrocardiograms in the five patients.
3. One patient in this group had had his third acute infarction with persistent anginal pain. On the sixth post-ligation day he was free of the anginal attacks and has remained free of pain for nine months.

**Results in Group II.**—Twenty-five patients with positive electrocardiographic evidence of coronary artery disease with angina, ages forty-two to sixty-eight:

Ten of these twenty-five patients are free of angina, one to eight months post-ligation. Among these there were:

1. No post-ligation deaths.
2. No electrocardiographic evidence of improvement.

Fifteen of the twenty-five patients obtained no relief from their symptoms, post-ligation:

1. Two of the patients have since expired: one died two months post-ligation, at age sixty-eight. The second patient died six months post-ligation, at age forty-eight.
2. At necropsy hearts of both the aforementioned patients revealed extensive coronary stenosis with multiple areas of segmental occlusion and diffuse myocardial fibrosis.

#### Summary and Conclusion

The results obtained in the acute postinfarction group of patients demonstrate electrocardiographic and clinical evidence of improvement. We believe that the operation might be valuable in the early treatment of patients with acute extensive postinfarction states. However, a large num-

ber of cases having been operated upon should be evaluated critically in order to substantiate our findings.

The results in patients with the diffuse stenosing type of coronary artery disease are less conclusive. There has been no clinical evidence of physiologic improvement in any of the patients, although 40 per cent are reported free of pain. We must assume at the present time that the procedure is more a surgical method of psychotherapy for those patients having developed a cardiac neurosis.

#### Addendum

Since reporting this clinical study, seven of the fifteen patients in Group II who obtained no relief for their angina and dyspnea have undergone operation again. A complete revascularization operation<sup>7</sup> was done. Four of these patients are completely free of their angina and associated dyspnea five to seven months postsurgically. Three patients continue to have occasional pain which is less intense and not associated with shortness of breath. They state their anginal attacks have been less frequent since the last operation.

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# Investigation and Treatment of Infertility

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**I**NFERTILITY, as we all know, is not an infrequent complaint. In both the investigative and treatment phases of this problem, the doctor consulted must be thinking in terms of the anatomy, the physiology and the psychology involved. One factor should not be investigated while neglecting the others which may be involved.

Reynolds<sup>17</sup> suggests that the primary function of the uterus is to accommodate the products of conception for a period of time characteristic of the species, then to deliver—through the process of parturition—an individual capable of independent existence. It seems likely that basic instincts and thoughtfully developed desire will usually combine to assure that most women will want children.

Conception often proves difficult when the desire to have a child seems most intense. To make matters worse, abortion is not unlikely when conception has proven most difficult. Failure to conceive, while at first only disturbing, may become frustrating and eventually an obsession. Prospective parents may exhibit a noticeable progression of tension if pregnancies result in abortion or loss of a child in late pregnancy when success finally seems assured.

Data<sup>16</sup> from our own practice certainly reaffirm the prognostic value of a poor obstetrical history. Hughes,<sup>9</sup> Schoeneck,<sup>20</sup> and their associates, as well as the Smiths,<sup>22-24</sup> Javert<sup>11</sup> and others, have emphasized the continuity of the etiologic factors evident in infertility, abortion and the complications of late pregnancy—referable to an inadequate placenta. Mere ability to conceive is, therefore, no assurance of parenthood, for human pregnancy not infrequently fails to produce a healthy child and fetal loss remains a major problem.

The means and ability to investigate properly the couple unable, apparently, to achieve a successful pregnancy, are now widely available. We can no longer justify a fatalistic attitude in regard to

infertility, the occurrence of abortion or of stillbirths.

When infertility, abortion or any type of fetal loss suggest that we should recognize the couple's problem as a possibly serious one, there is need to institute measures to improve the probability that pregnancy, when next achieved, will be maintained to successful completion at term. In our own practice, we have been impressed by the *infrequency* of abortion when conception occurs following institution of the preconceptional measures consistently recommended by Hughes for many years.

What then, are the measures we should recommend when infertility appears to be the problem? We believe the measures of established value are so well known to all physicians that a recommended plan of investigation need not be outlined at this time. It would be well, however, when the wife comes to us expecting investigation (and probably treatment) for infertility, to look upon both would-be parents as a couple with a problem which may have multiple causes rather than a single cause.

deWatteville<sup>5</sup> believes that in all reports evaluating the possible causes of sterility, we will find a sizable number of cases in which the individuals are without any morphologic pathology to explain their difficulty. It is admitted, however, that at present we still do not know all the etiologic factors preventing conception. Lack of vitamins or hormones may, for example, be such a factor—even when there is no clinical evidence of an actual deficiency as measured by our present methods. Thyroid extract, for instance, has many proponents and the apparent effectiveness of thyroid can at times hardly be denied.

The general health of both the husband and wife must be evaluated and, whenever indicated, measures to improve any recognized deficiency should be advised. The importance of such empirically-prescribed measures as dietary changes, the administration of vitamins or thyroid extract

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have, of course, been discredited by more recent scientific investigations. In the management of the patient, however, the importance of such measures should not be forgotten. To the discouraged, apparently-infertile couple, whatever treatment is recommended by their doctor is likely to contribute to the solution of their problem.

Rogers<sup>10</sup> has recently reminded us that a significant number of women presenting themselves with the problem of infertility may conceive rather promptly after a single interview or examination, prior to the institution of any therapeutic measures. He has also emphasized the rather common experience of an apparently-sterile couple accomplishing a pregnancy soon after completion of the recommended investigation, presumably as a result of the release of an appreciable degree of tension. In some patients, emotional problems may be recognized readily while in others, though not apparent, tensions are none-the-less real. Repeatedly it seems that, having gained insight into their emotional problems after release of fears and tension and having gained assurance of the fact that their situation is not unique, couples do achieve pregnancies that at the present cannot be credited to any other therapy than the psychological measures employed in an effort to understand their problem.

Frustration and anxiety must, at least to some extent, account for the decision of all infertile couples to seek medical advice. The importance of psychiatry as a part of an infertility study is widely recognized. Psychiatric consultants are available in all clinics and centers offering facilities for adequate study of a barren marriage. Too often, however, the psychiatrist is called upon only after the apparent elimination of all the anatomic, physiologic and endocrinologic causes that were thought to be demonstrable. Such use of psychiatry as a last resort has seemed wrong to Sturgis.<sup>28-29</sup> Rather than referring for psychiatric help only those couples in whom emotional factors seemed likely because all else seemed negative, he has made an effort to include a routine psychiatric screening interview of each husband and wife at an early phase of the investigation of each couple. Sturgis reports that such psychiatric evaluation was satisfactorily accomplished in twenty-five of forty unselected new cases. He was pleased to find that only six of the forty couples so advised were unwilling to go through with the interviews after appointments had been made. The frequency with

which unrealistic fears (and occasionally perfectly rational anxieties) were encountered by the psychiatrist has led Sturgis to conclude that much may be gained by continuing this procedure as an important part of the routine investigation to be recommended for all new cases.

deWatteville emphasized the fact that in our country, unfortunately, the psychiatrist is still considered by the major part of the population as a man exclusively treating mental patients. He believes that in many instances, when recommending a psychiatrist, the gynecologist may hear evidence of a state of mind once expressed by one of deWatteville's own patients, who, when psychiatric consultation was suggested—quickly replied, "But, doctor, what I want is not a psychiatrist, but a baby!"

Marsh and Vollmar<sup>15</sup> believe that the general physician may at times be a far better psychotherapist than he believes, and that by no means should all suspected cases of psychogenic sterility be immediately referred to the psychiatrist. Psychotherapy functions best in that long understanding relationship often evident between family physician and one of his "old" patients. Such understanding provides a most desirable type of background for the discussion of personal problems. Having experienced much of life and having gained rare insight into human attitudes, the family physician has for years been building the confidence of his patients even while carrying out the simplest of investigations and treatments. Often he is the one able to help a woman regain her self confidence, armed with which she is likely to show an improved attitude toward those around her. Stone and Ward<sup>26</sup> have emphasized the effectiveness of this informal homely type of psychotherapy in the management of infertility problems.

There is no doubt but that many women become pregnant in spite of a considerable degree of frigidity. According to deWatteville, however, the importance of orgasm as a means of promoting sperm migration into the uterus should not be disregarded. He believes that psychological conditions are indeed capable of causing functional disorders of the genital organs in both men and women, and that such may lead to sterility.

Marsh and Vollmar have observed, within the same disturbed patient, both psychiatric disorders and endometrial hyperplasia resulting from anovulatory cycles. In some mentally disturbed women, the same observers noted engorgement of

pelvic veins to a degree thought likely to be able to account for such degrees of ovarian failure. Tubal spasm may also be regarded as but another evidence of the importance of psychosomatic factors. Through his culdoscope, Decker<sup>4</sup> has observed contractions of the fibromuscular ligament of the ovary, and has wondered whether alteration in the contractual function of these ligaments may not be one of the ways by which psychogenic factors operate to delay conception.

Heiman<sup>8</sup> considers one-child sterility to be a special type of psychological conflict, in which the first child represents a re-establishment of the mother-child relationship the way it existed for the patient as a young child. As a result, the wife subconsciously resists disruption of this relationship by a third party, that is, an additional child. Another interesting and not exceptional observation concerns the frequency of pregnancy occurring after adoption of a child. The generally acceptable explanation requires belief that the degree of emotional tension persisting throughout the period of sterility has been relieved. The care of the adopted child proves time-consuming and a distraction in which a subconscious dread of the responsibilities involved in maternity are likely to disappear.

We must not forget the evidence suggesting that psychologic factors also play an important role in the problem of repeated abortion. Mann<sup>14</sup> has reported cases of habitual abortion for which only psychiatric measures were employed as treatment during the patient's next pregnancy. Before treatment, 93.3 per cent of the pregnancies in this group had ended in abortion whereas, after psychotherapy, only 16.6 per cent of the pregnancies conceived by these same couples terminated in abortion.

All would agree, however, that there are reasons other than psychological ones why the fertilized ovum may fail to become implanted and fail to remain safely attached within the uterus. Unfortunately, we lack reliable data suggesting the relative frequency of the many possible causes of fetal loss. Corner<sup>2</sup> believes that irritability of the uterus, at least in some cases caused by a relative deficiency of progesterone, is a pathogenic factor in a good many spontaneous abortions.

For many years American embryologists and practitioners alike accepted Mall's dictum<sup>12,13</sup> that all abnormalities of amnion and fetal development were due to faulty implantation resulting from dis-

eases of the uterine lining. Corner's<sup>3</sup> investigations, beginning in the early 1920's, convinced him of the fact that much prenatal wastage was the result of genetic causes. Streeter's<sup>27</sup> influence seemed to swing the pendulum of thought almost all the way—to a wholly genetic explanation of human pregnancy wastage. In the last decade, however, much experimental work has seemed to warrant belief that constitutionally-sound embryos may perish or suffer irreparable damage because of nutritional defects inherent in the maternal environment.

The consequences of inadequate vascularity (and, therefore, nutritional deficiencies) within the endometrium have been thoroughly studied by Hughes, Lloyd<sup>10</sup> and their associates. These investigations also have emphasized the effectiveness of preconceptional treatment if suitable measures are employed long enough to assure adequacy of the progesterational endometrium in the next pregnancy. Hughes' observations might well remind us that much of the current emphasis on the psychological aspects of infertility must not blind us to the importance of the most frequent causes of sterility. Recent evaluations of infertility studies suggest that nearly three-fourths of all cases are due, at least in part, to some anatomic or physiologic variation from the normal.

Anatomic variations (congenital abnormalities) might well be considered first. In this regard, abnormalities of both the fundus and the cervix should be considered. The varied degrees of reduplication or bifurcation of the fundus not infrequently seem to account for abnormal location and inadequacies of the placenta. More recently, inadequacy or incompetence of the inner os of the cervix has seemed to warrant an increasing amount of attention. This defect can apparently be due either to post-traumatic or congenital weakness of the sphincter-like action of the inner os—with herniation and rupture of the membranes accounting for late abortion or premature labor.

Recognition of congenital abnormalities, determination of the time and frequency of ovulation, and of the adequacy of corpus luteum effect, evaluation of the semen, as well as determination of tubal patency, all are investigations which must be taken into consideration routinely.

Rock<sup>18</sup> finds that there is no indication for dilatation and curettage of the uterus during the investigation of infertility—that an endometrial biopsy provides all the information necessary to understand the problem and institute treatment.

He believes that abnormalities of the uterus, whether partial or complete, are not incompatible with normal pregnancy, but he recommends that, when ovulation and properly-timed insemination have been adequately frequent throughout a period of, say, two years and uterine abnormality has been proven by hystrogram, a plastic procedure be considered. He also believes that retroversion resulting in anterior displacement of the cervix may be an important factor but that replacement of the fundus, if necessary under anesthesia, and proper downward and backward replacement of the cervix by the use of a constantly worn pessary can, except in some nullipara, usually be expected to correct the situation.

Rock also believes that only by laparotomy is one able to detect adhesions within the fimbriae of the oviduct. Though the gas of the Rubin test may pass through and around such adhesions and x-ray media may seem to escape normally, adhesions can sometimes be found at laparotomy that decrease the mobility of the tube by spreading of the fan-shaped fimbriae with fine, smooth-tipped forceps. He believes that such adhesions can be incised and if hemostasis is assured, the mobility of the fimbriae is likely to be improved. Rock emphasizes that special instruments are of considerable importance when attempting any plastic operation for tubal obstruction. He believes also, that cornual angle implantations are more likely to succeed if the isthmus portion of the tube is sacrificed, and polyethylene tubing is threaded through the oviduct into the uterine cavity, to be fixed later to the portion of the cervix and removed per vagina after six or eight weeks. Operations around the fimbriae might well include the use of the polyethylene hoods Rock has described, which, however, unfortunately require a second laparotomy for their removal.

Endometriosis may be expected in somewhat less than one-third of the infertility problems that are operated for suspected adnexal pathology. Only in about half of the cases, however, are the lesions such as would actually seem to interfere with adnexal function. When adnexal pathology (whether inflammation or endometriosis) is suspected but not clinically evident, it has been suggested that culdoscopy may demonstrate an explanation of the difficulty.

When unilateral adhesions result in mutilization of the ovary or tube on one side to a degree that seems to jeopardize that adnexa's ability to func-

tion, some authors have advised, in the interest of that individual's fertility, to remove a "useless" ovary, when it has been made useless by a distorted, functionless adjacent tube. Such oöphorectomy is said to assure greater frequency of ovulation from the remaining ovary that is adjacent to a normally-functioning tube. Such prophylactic removal of an ovary adjacent to a non-functioning tube, at least to us, suggests overemphasis on the procreative function of an ovary, with less than due consideration of the worth of every ovary as a gland of internal secretion.

Buxton and Mastroianni<sup>1</sup> have recently emphasized that what might well be considered transportation failure in the tube may occur though the tube appears to be open and suggests that such difficulties should remind us that there are limitations in the significance of both the radiographic method and the Rubin insufflation method of evaluating the tube's ability to function.

In a discussion of the relative merits of repeated Rubin tests versus tubal plastic procedures, in 1957 Greenhill<sup>6</sup> again stated an old conviction that no surgery should be attempted in an effort to restore tubal patency without first attempting to open the tubes by a series of Rubin tests. In 1937, Greenhill<sup>7</sup> collected a series of 818 plastic tubal operations performed by a number of American gynecologists and reported that such efforts had apparently resulted in the birth of only thirty-six live babies: one live baby per each 22.5 operations, a success rate of only 4.4 per cent. His more recent study, restricted to a group of operators who had performed at least ten operations for tubal closure, resulted in the collection of a total series of 2,113 such operations following which 313 live children were born: one child after each six and a half operations, or success in 15.1 per cent of cases operated. Siegler and Hellman<sup>21</sup> have reported the collection of 2,285 cases of attempted tubal repair following which 378 live births occurred, one baby per six operations or success in 16.6 per cent of cases.

Southam and Buxton<sup>25</sup> have recently reported a group of 1,437 patients studied for sterility, each followed for a minimum of one year. In the total group, 22.4 per cent became pregnant within one year. At least 39.2 per cent eventually became pregnant. Twenty-four per cent of all pregnancies occurred two months after the first interview, regardless of the duration of their sterility. These investigators noted a slight but significant trend



toward decreasing fertility with the patients' increasing age. They found that pelvic inflammatory disease was the only abnormality detrimental to conception which was demonstrable on routine pelvic examination. Seventy-one per cent of the known pregnancies in their series terminated in the birth of a live child. Among patients with secondary sterility there was less pregnancy wastage after sterility than there had been before.

Stone and Ward<sup>26</sup> have recently presented a study of 500 pregnancies occurring among patients examined and treated by the fertility service of the Margaret Sanger Research Bureau. Over one-half of the couples who became pregnant did so within six months of their first registration in the clinic: over 80 per cent of the conceptions occurred within the first year. The factors apparently responsible for the pregnancy were divided into groups. Treatment of multiple and psychologic factors accounted for 50 per cent of the pregnancies, and an additional 30 per cent were ascribed to the treatment of tubal and cervical disorders. Only 5 per cent were considered due to observed improvement in the fertility of the male. The remaining 15 per cent were distributed among six other factors. The outcome of the pregnancy was known in 465 instances. Including neonatal deaths and fetal defects, there was a total pregnancy wastage of 20.6 per cent, not significantly greater than the pregnancy loss among our population, at large.

We have recently reviewed the results of the management of 534 patients whose complaint of apparent sterility has been investigated in our own office within recent years. This experience represents the combined practices of a group of four obstetrician-gynecologists, and we believe that our figures may be regarded as an indication of the results one might expect when referring a sterility problem to the average obstetrician-gynecologist at the present time.

We have excluded from our data all instances in which the wife sought advice before the couple had been trying to achieve a pregnancy for at least two years.

It has been surprising to us to learn that approximately 25 per cent of our cases failed to complete even the investigation recommended. It is our impression that in many instances (perhaps through our failure to enumerate the items that would make the investigative phase relatively expensive) patients are discouraged from continuing

the study. The fact that office calls do not later or repeatedly involve such procedures as biopsy or tubal insufflation should perhaps be emphasized at the earlier investigative visits. Moreover, while it is not logical to begin treatment before an investigation has been completed, such apparent efforts on our part would probably instill a greater confidence in some patients.

Endometrial biopsy—evaluated by the histochemical criteria of Hughes as well as by the usual histologic considerations—gave us evidence that an endometrial deficiency was at least partially responsible for the difficulty in 30 per cent of our cases. Infertility was considered due to relatively poor semen in 26 per cent of the males examined, but pregnancy occurring apparently as a result of an improvement in male fertility was very rarely observed. Tubal closure was demonstrable in but 7 per cent of our cases.

Our results, in terms of the pregnancies achieved, do not include pregnancies accomplished after these women failed to return to our office. We have made no attempt to obtain a follow-up of the patients who did not return.

Among cases of primary sterility, 30 per cent became pregnant while under observation whereas 62 per cent of those who had previously achieved one or more pregnancies again became pregnant during the period of observation or treatment. Over-all, a little over one-third of our cases became pregnant while under observation; 57 per cent of those became pregnant during the time investigation was being carried out, 12.5 per cent became pregnant while under treatment, and the remaining 30.5 per cent became pregnant after the recommended investigation had been completed—and while "on holiday" at least as regards all treatment and all semblance of really scientific effort to achieve a pregnancy. Among those who became pregnant, however, nearly one-third either aborted or for one reason or another failed to deliver a living baby at term. Ectopic gestation alone accounted for one-third of this fetal loss, terminating 7 per cent of the pregnancies achieved.

In conclusion, we believe there is reason to believe that even normal apparently stable individuals may at times be victims of tension due to financial responsibilities, excessive social or political stress—anything adding strain to their lives—which may account for instances of purely psychosomatic sterility.

We would suggest, therefore, that when sterility

seems apparent, an orderly investigation should include efforts to be helpfully reassuring to the patient. There is good reason to believe that the measures employed will ultimately seem to have been of therapeutic value. When pregnancy is achieved but fetal loss occurs, investigative measures are less likely to seem of therapeutic value. In such instances, treatment to assure an optimal environment for an early embryo seems most effective when employed before conception is again evident.

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# DO MENTAL POWERS DEGENERATE?

There is mounting evidence that mental powers do not decline after middle age, reports a University of Michigan expert.

Popular belief in the inevitability of mental decline after age forty or fifty stems from early tests conducted on cross sections of the total population several years ago, explains Wilma Donahue, Ph.D., chairman of the University of Michigan Division of Gerontology. These early tests showed younger persons were more intelligent than their elders.

But now—thirty years after the first test—a recheck of some of the "youngsters" by Iowa State College re-

searchers has shown a considerable gain in average intelligence scores. In fact, none of those taking the tests a second time did poorer than on their first attempt three decades ago. The tests were not used to measure changes in the same individuals over a period of time. Instead, they compared the performance of different people of different ages.

Dr. Donahue believes that plain, lazy habits of thinking—simple failure to use the "old noggin" regularly—are probably as great a threat to continued mental health as physical and emotional mishaps the individual may encounter.

# Injury Reduction by Identification of the Accident-prone Worker

By Kermit T. Johnstone, M.D.  
Saginaw, Michigan

THIS report deals with a method of injury control which has been used in a large malleable iron foundry for three years. During this time we have noted a 37 per cent reduction in the incidence of injuries and a 50 per cent lessening of injury severity as measured by the number of dispensary visits needed for their care. The reduction of dispensary visits has produced a savings of \$38,000.00 worth of man-hours during the years of 1955, 1956 and 1957. During 1957, this item alone amounted to \$1.46 for every 1,000 hours worked.

Many of the injuries are produced by unrecognized job hazards. Since the injuries happen at odd intervals, and to different men doing the same job, the foreman in charge does not realize that there is a job factor operating. These situations are revealed when the performance of the individual worker is compared with that of the plant as a whole. There will be an undue frequency of injury. The cause of this may be in the job itself or in the way the man is doing his work. We have found that a man will demonstrate his way of doing his job in a two-month period. The problem becomes: *How often can a man expect to be injured in a two-month period?* There is no pat answer to that question for the likelihood of injury varies too widely from one industry to another. If a worker reports one injury a year he presents no problem. However, if he comes in every other day with a fresh injury and we have seen just that occur there most certainly is a problem with him, his job, or both.

The man's record must be compared with that of the other workers in his plant. The record of the other employees is the over-all incidence of injuries in the plant. This is expressed as the number of injuries reported per thousand man-hours worked.

The number of injuries to be expected per man

in a two-month period is easily computed. Based on a forty-hour week, it is .346 times the injury rate per thousand man-hours, plus two times the square root of that product. For a forty-eight-hour week, the decimal 0.412 is substituted for .346. For example: Let's take our 1954 injury rate. It was 3.92. We were treating four new injuries for every thousand man-hours worked during that year. The formula worked out this way:

$.346 \times 3.92$  plus two times the square root of that product.

This is 1.36 plus 2.34 or 3.70. The individual that reported four or more injuries in two months that year was sufficiently above plant average to justify asking *why*. We found in talking to these men that nine out of ten knew why they were getting hurt.

To put this program into effect several requirements had to be met.

1. We could not add any personnel to the payroll since we had a budget to live with. This, I understand, is a rather common situation.

2. The information had to be in such form that a supervisor knowing nothing about medical statistics could use it to interview a man.

3. It had to be current. To give a foreman a list of injuries that occurred four, five or six months ago is useless. The circumstances of the injuries by that time have been forgotten by the individual.

4. We wanted to identify *all* of the men that were involved, regardless of the job they were doing. At the same time we wished to leave undisturbed the others.

The following procedure has answered all of these requirements:

1. A simple method of coding reported injuries in the form of a fraction is used to indicate the part of the body involved and the type of injury. This code may be varied to accommodate injuries peculiar to any type of industry.

Presented at the Michigan Clinical Institute, Detroit, March 19-21, 1958.

# INJURY REDUCTION—JOHNSTONE

## INJURY REPORTING CODE

### Injury Code

1. Abrasion—Contusion	11. Fracture	21. Disc—Cartilage
2. Laceration—Puncture Wound	12. Foreign Body	22. Dislocation
3. Sprain—Strain	13. Infectious Dermatitis	23. Bursitis
4. Ache or Pain	14. Contact Dermatitis	24. Concussion
5. Friction Burn	15. Amputation	25. Occupational Disease
6. Thermal Burn	16. Tenosynovitis	26. Respiratory Illness
7. Ultra Violet Burn	17. Bleeding	27. Intestinal Illness
8. Local Infection	18. Hernia	28. Genito-Urinary Illness
9. General Infection	19. Fumes—Co.	29. Other Illness
10. Heat Stroke—Exhaustion	20. Arthritis	30. Death

### Anatomical Code

A. ARM	E. EYE	F. FACE	C. CHEST	Ne. NECK
1. Fingers	1. Lid	1. Brow	1. Front	1. Front
2. Hand	2. Cornea	2. Cheek	2. Side	2. Side
3. Wrist	3. Sclera	3. Chin	3. Back	3. Back
4. Lower Arm				
5. Elbow	B. BACK	Ea. EAR	S. STOMACH	
6. Upper Arm	1. Lumbar	1. Lobe	1. Front	
7. Shoulder	2. Sacral	2. Canal	2. Side	
8. Scapula	3. Coccyx	3. Drum	3. Groin	
L. LEG	N. NOSE	M. MOUTH	G. GENITALS	
1. Toes	1. Nose	1. Lips	1. Penis	
2. Foot	2. Nostril	2. Teeth	2. Scrotum	
3. Heel & ankle	3. Bridge	3. Tongue	3. Prostate	
4. Lower leg			4. Labia	
5. Knee	H. HEAD	T. THROAT	5. Urethra	
6. Upper leg	1. Top	1. Tonsils	6. Vagina	
7. Hip	2. Side	2. Pharynx	7. Rectum	
8. Buttock	3. Back	3. Larynx		

R—Right

L—Left

B—Bilateral

M—Moderate

S—Severe

SH—Sent Home

XR—X-ray

Px.—Physical Exam.

LDW—Last Day Worked

RW—Returned to Work

### FILE CARD

11028	H. E.	
8/5/55	N/5	3/26/57 LA4 & NE3/6*
8/19/55	RA2/5	4/10/57 LA2/1
8/25/55	LA15/4	4/23/57 BA11/5
9/20/55	LL3/5*	5/17/57 LA12/2
2/23/56	LA2/1	9/26/57 LE/12
4/25/56	RA4/6	11/11/57 RA2/6
5/24/56	BE/12	11/26/57 RA2/6*
6/15/56	BA3/1	12/12/57 RA2/6
6/29/56	SRL3/6*	12/18/57 F1/6
8/22/56	M1/6	1/23/58 LE/12
8/27/56	RA12/1	
9/10/56	RA11/14*	
9/19/56	LA12/2	
9/26/56	LL5/1	
2/14/57	LE/12	
2/18/57	N/6	
3/19/57	H3/2	

\*Line Indicates Reported to Supervision.

2. When a worker comes in, the nurse notes the injury on her daily report, showing the badge number and the injury in code. Thus, the nota-

tion 35016 RA3/3 means a man having that number suffered a sprained right wrist.

3. An inexpensive 5 x 8" file was set up with a card for each man, showing his name and badge number.

4. Each day the nurse or clerk posts the preceding day's injuries to these cards. The entry shows the date of injury and its code.

5. At the time of posting the cards showing more than the allowable number of injuries in the preceding two months are laid to one side. The others are refilled.

6. The selected cards are used to compose a report to the department superintendent and plant management, showing the man's name, badge number, dates and types of injuries.

7. Within twenty-four hours the superintendent or general foreman interviews the man regarding these injuries.

The tone of the interview is *most* important. The man is never criticized for being injured too often. The supervisor, instead, asks how the in-

# INJURY REDUCTION—JOHNSTONE

LETTER FORM

CENTRAL FOUNDRY DIVISION  
SAGINAW MALLEABLE IRON PLANT  
GENERAL MOTORS CORPORATION  
INTER-ORGANIZATION LETTERS ONLY  
DATE 11-26-57

SUBJECT Individual Injuries

TO All Department Superintendents

ADDRESS Saginaw Malleable Iron Plant

The following injuries have been reported by these individuals:

11028 H. E.	9-26-57 Foreign body—left eye
	11-11-57 Burn—right hand
	11-26-57 Burn—right hand
11012 R. R.	10-22-57 Burn—left ankle
	10-24-57 Laceration—left foot
	11-26-57 Abrasion—left wrist
12290 E. N.	11-13-57 Foreign body—both eyes
	11-22-57 Strain—left wrist
	11-26-57 Contusion—right ring finger
16685 McK. M.	11-14-57 Foreign body—right eye
	11-22-57 Foreign body—left middle finger
	11-26-57 Abrasion—left index finger

cc:  
Corp  
Karam  
Orloff  
Leppien  
Gleffe  
Phelan  
Koval  
Howard  
Goodrich  
File

(Signed) K. T. Johnstone, M.D.  
Medical Director

juries occur and what he, the supervisor, can or should do about it. This approach has turned out to be very favorable from the psychological standpoint. All of us have at one time or another, longed for the day when we could tell the boss how the job could be done better. Approximately 97 per cent of the men interviewed knew exactly why the injuries occurred. Very often they had sensible suggestions as to how they could be avoided.

The oral interview is a much less formal approach than the suggestion plan. That requires the completion of a form. Writing does not come easy to the men with whom we work. For that matter, in writing this paper, I have found that it doesn't come easy to me either.

It has been our experience that the farther a man exceeds the expected number of injuries, the more definite is the operating cause. When these factors are recognized they can be corrected, not only for the man involved but also for the others doing the same work.

An unexpected bonus that we did not foresee has turned up in this program. All injuries are noted, even the most trivial. At first, this appears to be unnecessary. However, whether a shear blade skins a finger as it closes, or takes the finger off, is only the question of a fraction of an inch, or the fraction of a second. The stage has been set, so to speak, for either to happen. The men soon realize that the supervisor is just as interested in the scratched fingers as the amputated ones. The man that is careful enough to avoid scratches is not going to put his whole hand into a press. For this reason we have seen both the minor and more serious injuries decline.

Earlier, mention was made that about 97 per cent of the individuals were co-operative. The remaining 3 per cent were different.

1. Their injuries followed no pattern. In a group of five or six reported injuries they are scattered over the body and of different types, in-

(Continued on Page 134)



# Tic Douloureux

By Austin E. Lamberts, M.D.

Grand Rapids, Michigan

**TIC DOULOUREUX**, also called trigeminal neuralgia, is usually relieved by diphenylhydantoin (Dilantin) given orally. Thirty patients with this diagnosis were given capsules of diphenylhydantoin, 1/10 gm. t.i.d., as specific treatment and in almost every instance relief from pain was complete within forty-eight hours, but usually not before twenty-four hours after treatment was begun. The dosage had to be doubled in two of these people before the pain disappeared and in only one woman was it ineffective initially.

In this present series, which was observed over a four-year period, the diagnosis was established by obtaining a history from each patient and then performing a neurologic examination to eliminate other causes of face pain. The patients were equally divided as to sex and with an age span from thirty-one to eighty-six years. The average age and the mean age was sixty years. All of these people had paroxysmal lancinating pains in the face occurring spontaneously or after mechanical stimulation of trigger points by eating, chewing, washing the face or even by exposure to a cold breeze. Various divisions of the trigeminal nerve were involved and, in general, the histories obtained were comparable to those given in any textbook of neurology where this subject is discussed. On neurological examination, none of these people had a neurologic deficit in the trigeminal pattern nor was the corneal reflex lost in any of them. Without exception, these people had had other forms of treatment including adjustments of the cervical spine, parenteral vitamin injections and foreign protein therapy. Some of them had had nerve blocks with alcohol with subsequent return of sensitivity, and all of them had undergone dental examinations. One patient had probable involvement of both the trigeminal and glossopharyngeal nerves.

After a clinical diagnosis has been established, each patient (as well as his family), was given a brief résumé of the known facts of the disease. He was told that the exact cause for the pain had never been established and that the only

positive relief of symptoms could be obtained by sectioning the offending nerve roots intracranially. He was told that the disease is characterized by flare-ups of the pain and spontaneous remissions which have been known to persist as long as forty-two years. If any treatment is continued long enough, a remission will be forthcoming providing the patient can tolerate the pain that long. Our purpose as explained to each patient, was to produce a remission and not a cure. He was then given a prescription for Diphenylhydantoin to be taken one capsule of 1/10 gm. each, t.i.d., following meals.

The results of this treatment were gratifying. In most of these patients the pain left abruptly on the second day of treatment and could then no longer be precipitated by stimulation of the trigger points. Medication was continued for thirty days and symptoms were re-evaluated. Some of this group noted tiny twinges of pain early in the morning before they had taken the first capsule of Diphenylhydantoin but this served as a guide for continuation of treatment. For those who had no pain, treatment was discontinued unless there was an exacerbation of the discomfort. In several patients symptoms recurred within forty-eight hours after cessation of medication only to subside as treatment was resumed.

In spite of the favorable initial response many patients in this series eventually developed intractable tic douloureux which did not respond to further medication even when it was pushed to the point of intoxication. This segment included twelve patients and to these surgical treatment was recommended. In this dozen patients a trigeminal decompression as recommended by Taarnhoj<sup>1</sup> was performed with lasting relief of symptoms up to three years but without paraesthesias, numbness or the other unpleasant sequela which may follow section of the retro gasserian fibers.

The use of diphenylhydantoin for trigeminal neuralgia was advocated by Roques<sup>2</sup> in France in 1951 and again by Hans Peter Jensen<sup>3</sup> in Germany in 1954. These workers also concluded

that this was a valuable medication in producing remissions from the pain though they did not attempt to explain how it did so. Tic douloureux has been classed as a paroxysmal disorder and as such it is related to the convulsive disorders, but we do not believe that the basic cause of this condition has been discovered. It may be significant that an anti-convulsant medicine is effective in controlling this paroxysmal pain. The following cases may be of interest.

### Case Reports

*Case 1.*—C. Mc. M. was about fifty-two years old when he had the onset of paroxysmal lightning-like stabs of pain in the left cheek. Initially he had spontaneous remissions for months at a time but eventually he looked for relief and had many treatments including injections of the nerve with alcohol and avulsion of the infraorbital division. After a remission of some months he had sudden onset of pain on September 1, 1954. When we saw him on September 20, 1954, he had had repeated hypodermic injections of narcotics and much oral barbiturates so that he staggered in—looking very unkempt. He was able, however, to give me a history. He talked about the twisting turning lightning pain which was so severe that he screamed with the onset of each new episode. The pain was precipitated by shaving, washing his face, touching the left cheek or by eating, so he tried to avoid all of these activities. His affliction was diagnosed as tic douloureux—2nd division on the left side—and diphenylhydantoin was prescribed, 1 gm., t.i.d., which he began at once. The following day at noon he had his final paroxysm and from then on he was pain-free and able to resume work as a tavern keeper. He occasionally had a mild flicker to remind him that his neuralgia was only dormant so he continued taking his medication until his sudden death from coronary occlusion on March 14, 1956. He had been free for one and one-half years. The longest remission since the disease had its onset.

*Case 2.*—L.S., a fifty-year-old housewife, developed severe pain in the left lower portion of her face about December 1, 1953. This was intermittent and touching a small area on the side of the tongue gave her an electric shock like pain through the tongue and left lower jaw. Talking, eating, drinking cold liquids or smoking all tended to set off a paroxysm of pain, although between times she was pain free. She had severe gingivitis and was convinced that this was the cause of her discomfort. The oral surgeon she consulted referred her to us for treatment of her tic douloureux. After performing a neurologic examination

we concurred in this diagnosis and prescribed diphenylhydantoin, .1 gm. t.i.d. She obtained complete relief of symptoms almost immediately, but within two weeks she had a recurrence of pain so increased the dosage of her medication to .2 gm. t.i.d., which gave her relief of the trigeminal neuralgia, but this caused such intoxication that she could no longer walk unassisted. However, she preferred this state to the painful state. Eventually she elected to have surgery performed and on October 8, 1954, a trigeminal decompression was performed under general anesthesia. Through a left subtemporal approach, the dura matter over the retro-gasserian roots was opened wide and the petrosal sinus was divided. She tolerated this procedure well and postoperatively had no recurrence of her tic douloureux. There was no motor weakness and the corneal reflexes were retained. This lady had in previous years had numerous complaints relating to almost every body system and postoperatively these continued unabated; however, she is able to do her housework as before and has had total relief of trigeminal discomforts to the present time.

Diphenylhydantoin has been given to other patients with face pain in similar dosage with no relief of symptoms. In this way we have learned that it is ineffective in trigeminal neuritis where there is a demonstrable neurologic defect, in paroxysmal vascular headaches, in derangements of the temporomandibular joint with secondary face pain or in other atypical face pains. We advised this medication for a seventy-seven-year-old woman who had trigeminal pain that we conjectured was due to a cerebello-pontine angle tumor. Her feebleness and lack of other evidences of disability dictated this course which gave a partial but satisfactory relief of symptoms.

Best results with this conservative management of tic douloureux have been in the older groups, and in these patients no intolerance to the medication was noted. We recommend this as a satisfactory means of giving relief to a high proportion of patients with acute tic douloureux.

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# Reconstructive Operation for Urethral Stricture

By Harry E. Lichtwardt, M.D., F.A.C.S.  
Birmingham, Michigan

**U**RETHRAL STRICTURE implies a pathologic diminution in the caliber of the urethral lumen and may be congenital or acquired. The acquired stricture, which is the result of infection or trauma, may be a crippling condition especially when complicated by fistulae, diverticula, urethral calculi, periurethral abscesses or urinary extravasation. Many methods have been proposed for its definitive treatment but most have met with little success.

In 1953, Bengt Johanson<sup>3</sup> devised a reconstructive operation which now refutes the old adage of "once a stricture always a stricture."

In 1949, Denis Browne<sup>2</sup> presented the buried-strip method for repair of hypospadias. He used the principle that a buried strip of skin will form a tube. Johanson incorporated this principle in his two-stage urethroplasty.

In the first stage of the procedure, he incised the strictured urethral mucosa and anastomosed it to the adjacent skin, in effect creating a hypospadias. A suitable period of time was allowed to elapse before the next stage was accomplished. In the second stage of the procedure, a strip of mucosa and adjacent skin was isolated and buried. In fourteen days a new urethra of adequate caliber was formed.

At Wayne County General Hospital, Eloise, Michigan, we have completed sixteen Johanson urethroplasties. Our indications for urethroplasty are:

1. Patients who require dilatations more often than every two months.
2. Patients who require general anesthesia for each dilatation and who require dilatations more frequently than every three months.
3. Patients with strictures complicated by urethral diverticula or urethro-cutaneous fistulae.
4. Patients thirty years or younger who require dilatations more often than every six months.
5. Patients with impassable strictures.

Presented at the annual meeting of the Michigan Chapter of the American College of Surgeons, March 18, 1958.

JANUARY, 1959

## Technique

Panendoscopy, cystoscopy and urethrograms are performed when possible to further evaluate the extent and severity of the stricture.

Depilation of the scrotal hair was done prior to the first stage, in the first thirteen cases, to prevent hair being incorporated into the buried skin strip. To some, this represents the first stage of the operation because of its tedious nature. Four to seven days are allowed for healing of the depilated scrotum.

The first stage is accomplished in strictures of the penile and distal bulbous urethra by making a longitudinal incision directly over the point at which a No. 26 French sound cannot pass. The incision is made through the skin, corpus spongiosum and urethral mucosa for the entire length of the stricture. The stricture is considered to be adequately incised when a No. 28 French sound can be passed with ease through the portion of urethra distal and proximal to the original stricture. The skin is anastomosed to the urethral mucosa with interrupted 3-0 chromic catgut sutures. A Foley catheter is passed into the bladder through the urethrostomy and left indwelling twenty-four to seventy-two hours.

Strictures of the deep bulbous and membranous urethra are approached through an inverted U perineal incision. The bulbous urethra is exposed and a longitudinal incision made over the entire stricture. The proximal extension can be made to the verumontanum without fear. If fistulae are present they should be completely excised at this point. Instead of anastomosing the incised urethra to adjacent skin, as is done for stricture of the pendulous urethra, it is necessary to draw a flap of scrotal skin down between the incised borders of the bulbous urethra. This maneuver will make it possible to anastomose the urethra to skin.

The scrotal flap is made by making a transverse incision midway between the perineal incision and the penoscrotal junction. The lower edge of the skin is then grasped and drawn down into the scrotum in an inverted manner. The remainder

of the scrotal skin is sutured to the urethra until a funnel-shaped urethrostomy is formed. Drains are placed in the scrotum for about three days and an indwelling Foley catheter left in the urethrostomy for forty-eight to seventy-two hours.

The second stage is performed a minimum of six weeks later depending upon the completeness of healing and vascularization. At the beginning of this stage the urine is diverted by a suprapubic cystostomy.

A strip of urethral mucosa and adjacent skin is incised which has the width of the circumference of a No. 28 French sound. This is contrary to the belief of Browne and Johanson, who feel that there is secondary epithelialization and the eventual circumference of the tube is greater than the width of the original buried skin strip. Studies by Nesbit and Butler<sup>4</sup> revealed that the eventual circumference of the buried skin tube is but little greater than the width of the original strip.

The lateral skin edges are undermined so they can be approximated over the buried skin strip without tension. Tension sutures of No. 32 wire<sup>1</sup> are used with pearl beads and aluminum tubing threaded over the wire. By this method the tubing may be cut, loosened and retrimmed to allow for postoperative edema. The skin edges are closed with No. 5-0 nylon sutures. In our more recent cases, this type of tension suture has been replaced by three layers of No. 32 wire sutures placed in a subcuticular manner, with excellent results. The wire sutures are removed on the seventh postoperative day and the nylon sutures three days later. The suprapubic tube is then clamped and the patient allowed to void through

the newly-formed urethra. If voiding is satisfactory the suprapubic tube is removed and calibration is done in about six weeks.

### Results

In analyzing the results of the sixteen Johanson urethroplasties performed at Wayne County General Hospital, thirteen were excellent. Two developed spontaneous closure of the proximal urethrostomy eight to ten weeks after the first stage, and have required periodic dilatations following the second stage. There is little mention of this complication in the literature. In our experience this seems to indicate that when spontaneous closure occurs, the first stage should be redone. In one patient a diverticulum developed at the proximal portion of the repair. His symptoms were eliminated by instructing him to apply perineal pressure postvoiding and thus emptying the diverticulum.

### Summary

The indications and technique of the Johanson urethroplasty for urethral stricture are described. The results of sixteen cases performed at Wayne County General Hospital are briefly reviewed.

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606 N. Woodward Ave.

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(Continued from Page 83)

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344 Glendale Avenue  
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## "You Gotta Have Heart"

The title is colloquial, a song lyric direct from Tinpan Alley, but the philosophy is as old as nature.

As medical men, we are concerned with the heart as an organ of the body and to good purpose we dedicate an issue of our Journal to its scientific exploration.

However, through the ages "heart" also has come to mean courage. And courage is often not a physical thing at all. This kind of "heart" is harder to evaluate scientifically, if indeed it can be. But it is equally as important to the patient as the organ itself.

I think this is true of the medical profession, too. Our organic heart is the medical society and its kindred constituent, component, and ancillary organizations. The proper functioning of this complex is dependent upon our decisions maintaining a delicate balance of interest, a smooth flow of information and the proper timing of action.

Sometimes, under attack by outside forces, this "heart" tries to crowd in an extra beat to keep up with the new irritation. It has extra systoles as the organization rises to meet the challenge.

Meanwhile, the other "heart," the fraternally-knit spirit of the profession, carries on with the same undaunted courage, the same confidence in itself and its ability to solve the problems of disease, of disruption and discouragement.

"You Gotta Have Heart" . . . both "hearts." And they're both yours!

*President's*



*Message*

*Gilbert B. Seelonschaefer*

*President, Michigan State Medical Society*



# Editorial

## NEW PROBLEMS—NEW RESPONSIBILITIES

With the opening of this new year, the medical profession in Michigan and in the United States generally faces new problems and new responsibilities but never yet has hesitated to meet the future. There have been some tremendous advances in medicine reported in the various assemblies, conferences and meetings—especially at the two American Medical Association sessions held annually and the two meetings sponsored by the Michigan State Medical Society (the Annual Session in September and the Michigan Clinical Institute in March.)

THE JOURNAL of the Michigan State Medical Society and other journals throughout the land have published these new reports. We are proud of what has been presented in Michigan, and we are proud of the tremendous amount of research work that our two medical schools have been doing. We are anticipating even greater rewards in the immediate future. The science of medicine has continued to advance and the medical practitioner must of necessity keep abreast of this work in order to give his patients his best and most skillful attention.

## MEDICAL EDUCATION

During the year, Wayne State University has accepted an extra fifty students in the freshman class, due in great measure to the activities of the Michigan State Medical Society and its representations to the legislature. An increase in the student body was authorized in an effort to supply the increased need of medical men in our state. The medical population is increasing much slower than our total population. Wayne State University Medical School will be graduating an extra fifty students when this class has passed through its training period. That is only the first step.

We must remember that the John Dale Russell report to the legislature regarding higher education in the State of Michigan emphasized the fact that Wayne State University Medical School should be brought to its fullest potentiality and should be supported strongly before any serious and

## AN HISTORIC DOCUMENT!!

*Supplementary Report H of Council on Medical Service—Voluntary Health Insurance or Prepayment Coverage for the Aged.*

—Your reference committee believes this report should be approved with the changes as underscored in the following:

"For persons over sixty-five years of age with reduced incomes and very modest resources, it is necessary immediately to develop further the voluntary health insurance or prepayment plans in a way that would be acceptable both to the recipients and the medical profession. The medical profession must continue to assert its leadership and responsibility for assuring adequate medical care for this group of our citizens.

"Therefore, the Council on Medical Service recommends to the House of Delegates the adoption of the following proposal: That the American Medical Association, the constituent and component medical societies, as well as physicians everywhere, expedite the development of an effective voluntary health insurance or prepayment program for the group over sixty-five with modest resources or low family income; that physicians agree to accept a level of compensation for medical services rendered to this group, which will permit the development of such insurance and prepayment plans at a reduced premium rate.

"This recommendation has been studied and restudied by the Board of Trustees and has received its wholehearted endorsement."

Your reference committee recommends that in order to effect the immediate implementation of such a program, copies of this report be distributed to medical society approved plans, including Blue Shield and private insurance programs, requesting their co-operation. (*Passed unanimously*)

economic thought be taken regarding the establishment of a third medical school. Physical facilities and an enlarged faculty can be more economically and readily acquired when Wayne State College of Medicine reaches its maximum capa-

city for training medical students before starting the third medical school.

A most important revision of the curriculum is soon to be announced by the College of Medicine involving a study over the past two years by the faculties of the Medical School, the College of Liberal Arts, and visiting medical educators with the objective of improving some of the most troublesome features of the "lockstep" medical curriculum.

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During this past year, the University of Michigan has taken an enormous step forward. Dean Furstenberg and his advisors have recognized the tremendous increase in volume of the material available and the fields open for teaching medical students. A study has been made and reports given looking to an evaluation of the scientific material, the teaching necessities, and suggestions for improving the curriculum in the near future. At the earliest possible moment, we shall publish a paper outlining and giving to our membership a picture of the program and plans being developed at one of the nation's medical colleges. The University of Michigan Medical School, in addition to its 762 students in the four undergraduate classes, has under instruction graduate medical students, interns, house physicians, specialty and board trainees, research workers, postgraduate and other students from closely allied professional groups, totalling more than 2300 persons in training.

In 1954, the problem of shortage of Doctors of Medicine in Michigan and our gross negligence in providing and training them prompted a survey. (See editorial, Page 1346, November, 1955). During the ten years ending in 1954, the Michigan State Board of Registration in Medicine had registered a total of 4,321 Doctors of Medicine as follows: 1,057 from the University of Michigan School of Medicine; 601 from Wayne University College of Medicine; 2,635 from other states, and twenty-eight foreign. Of course, some Michigan graduates went to other states, but the net difference was 2,663. The State of Michigan needed and secured an average each year of 266 medical men more than our own economy produced.

We have just completed a resurvey of the past five years. In the years from 1954 to November 21, 1958, the State Board of Registration in Medicine has licensed 2,476 medical graduates. Of these, 805 were graduated from the University of Michigan; 318 came from Wayne University; 1,185

were from other states, and 168 were from foreign schools, other than United States and Canada. We imported a net of 1,353, or an average per year of 271. During the last five years, the University of Michigan has graduated 871, indicating that a total of sixty-six went to other states. Michigan is in no way carrying its proportion of the educative and training burden to provide medical doctors for the care of her people (45.3 per cent)!

### THIRD MEDICAL SCHOOL?

A third medical school is still being considered, with several possibilities. A new medical school of necessity would demand close affiliation with a functioning University or College of Literature, Science and Arts in order to supply much of the undergraduate and premedical training necessary. Grand Rapids has been mentioned as a locale for a medical school. The Collegiate or University Association could be developed from the several colleges at present available there.

Kalamazoo was at one time mentioned as a suitable city for the projected medical school. It has Western State University, with the collegiate and scientific facilities—also Kalamazoo College, and Nazareth Academy—three collegiate institutions. Lansing, with its Michigan State University, was mentioned as a suitable site. In both these cities, hospital construction would be essential, and importation of clinical material for teaching and demonstration. Flint should also be mentioned, but it is understood that this is ambitious planning at present.

The Detroit area cannot be ignored. Detroit is the only great city in the United States with only one medical school. Collegiate or University bonds could be used. The University of Detroit or Dearborn Junior College might be available; at least, they are there and now functioning. In Detroit, there are many hospitals whose beds and patients could readily furnish clinic and research needs, including probably the world's largest free or relief and welfare concentration of patients at Eloise. In this situation, a medical science building would be needed.

### BLUE SHIELD

Blue Shield throughout the United States and Canada is now suffering from growing pains. The original concept and "raison d'être" was to provide essential medical care for the lower income group to whom, at that time, any considerable medical

attention constituted a calamity. Only limited but extremely essential surgical services were provided on a prepayment basis. The program was so successful that it expanded of its own efforts. During the years, demands for extended services and more coverage as well as "fringe benefits" have changed the very modest and unpretentious beginning into a "public trust," privately operated by the medical profession on nonprofit insurance principle basis, as well as stimulating a gigantic commercial insurance business.

For several years, leaders in the movement have been considering and advising the inclusion of many more benefits, and the elimination of certain inequalities and abuses. In the beginning, only hospitalized care was offered, in the belief that hospitalization with its proportionately greater impact on the family budget would aid in establishing the emergency and need for the surgery contemplated—the primary need. During the years, it became evident that many conditions could be cared for outside the hospital; that changing social trends were producing a demand for much broader benefits including hospital outpatient and office care, thus releasing hospital beds for more serious cases and reducing the overall costs.

In September, 1956, the House of Delegates of the Michigan State Medical Society officially appointed a study committee to take a new look at Michigan Medical Service, to co-operate with a committee already established by The Council for a similar purpose, with instructions to bring in a report at the 1957 Annual Session. The intervening period included a special session of the House of Delegates, authorization for a Market Study Survey, the reports of these two committees which furnished material and bases for the House of Delegates in September, 1957, to adopt a set of principles and give instructions for a complete modernization and elaboration of the prepaid medical care policy. In accordance with these principles and directives, a new medical care program, known as M-75, was created. Every effort was made to conform meticulously to the principles and directives and to establish a satisfactory fee schedule. All groups and specialties were invited to submit suggestions, but too many overlooked the deadline.

A temporary working relative value scale was established and a continuing study committee appointed. The new Relative Value Fee Scale Committee is expending thousands of hours and dollars

in an attempt to give us an independent Michigan schedule completely representative of our membership. Every known medical specialty has been invited to appoint representatives and confer with this basic committee.

It is appreciated that advances in medical science and changes in procedure will necessitate changes in any fee schedule through the months and years, since the relative value will change. For this reason, the House of Delegates has set up this permanent study committee, whose duty it is to suggest changes as they seem necessary. Counsellor District Committees also have been established all over the state with a permanent secretary. These committees are to confer with individual members who have problems or who consider that they have been inadequately paid for certain special services. Every attempt has been made to make available individual consideration for all unusual and problem cases.

Such is the accomplishment up until the year 1959. This year could be just as strenuous and just as vital to the non-profit medical care concept of the medical profession as the past years. In Michigan, our new program already covers over two million people, some of whom are certain to be very critical of the administration and functioning of our contracts.

There have always been and always will be members of our profession who have not and will not conform to the plans and programs set up by and for the majority. The Insurance Commissioner, before allowing our Blue Shield program to work, has demanded that a sufficient proportion of our members be participating in order to guarantee the adequate function of the plan. Our patients, including labor and management, have faith in us and will continue to have if we, as individual doctors or groups, give services, avoid abuses, and make the program work.

The next eight or ten months will be the time of decision. Will the medical profession continue to set its own rules of procedure, of service, of relationship with the public? Twenty or twenty-five years ago, the threat of the federal government to take over and administer a cradle-to-the-grave health program was very real. Some of our medical statesmen believe that that basic philosophy could again become rampant. It surely will, if the medical profession doesn't run its own business—and run it to the benefit of the people.

## A STATEMENT OF PRINCIPLES

One thing of importance to remember is that you all become representatives and officers of the AMA when you are seated as delegates in this House. You are chosen by your state or territorial association, or section to sit in this body and to decide what is the best for American medicine. You must have a general understanding of what your local group desires, yet you should vote as your intelligence and conscience dictate. If every delegate were to vote only as instructed, possibly weeks or even months before the meeting of the House, there would be little point in holding any meeting or convention. You could stay home and mail in your instructions to the central office where they would be summarized and the results announced. I have always found the members of this House to be men and women of the highest calibre, and we are proud of your actions.—E. VINCENT ASKAY, M.D., Speaker of the AMA House of Delegates.

## HEALTH CARE FOR OUR SENIOR CITIZENS

Prepayment of medical care for the elderly has long been a matter of urgent and continuing concern to the medical profession and its Blue Shield Plans. Within the past year, however, this problem has been made something of a political issue through the introduction of such legislation as the Forand Bill, which, if adopted, might radically affect the future of the entire voluntary health care movement in America.

What are the facts concerning Blue Shield coverage of senior citizens? What has the medical profession accomplished, through Blue Shield, to meet this challenge?

The answers to these questions will be of immediate interest as a New Congress meets—a Congress in which social welfare programs are certain to be accorded a high priority.

Some of these answers, as reported recently to the AMA Council on Medical Service by the national association of Blue Shield Plans, are truly encouraging.

Thus, in 1951, among a total Blue Shield enrollment of 21 million persons, nearly a million (a little less than 5 per cent) were over sixty-five years of age. Six years later, in 1957, among the total of 40 million persons enrolled, 2.5 million (6.5 per cent) were over age sixty-five. Thus, in these six

years, the number of Blue Shield members over sixty-five increased 170 per cent, while total Blue Shield enrollment increased only about 85 per cent.

Attention was called also to the fact that of the total number of people past sixty-five who have medical-surgical insurance coverage, about two-thirds are covered by Blue Shield.

Of all the people in the United States, it is estimated currently that about 15 million are over sixty-five years old, and are not cared for by an established institution or agency. This represents approximately 8 per cent of the total population. Thus Blue Shield's ratio of 6.5 over age sixty-five is reasonably related even now to the ratio of the total population in that group—and rapidly approaching parity with it.

Blue Shield has always sought to serve medicine's inescapable responsibility to the whole community. It was until recently almost an exclusively Blue Shield feature that any member on retirement, or on leaving an insured group, could retain his coverage by "conversion" to a "direct-pay" basis. Few Plans impose any age limits on initial group enrollment, and an increasing number of Plans are accepting non-group members regardless of age.

Blue Shield is aware of medicine's responsibility to our senior citizens, and is prepared to follow the guidance and leadership of the profession in helping it meet this challenge.

## STOMACH ULCERS

Charles J. Tupper, M.D., assistant professor of internal medicine told physicians attending a postgraduate course in gastroenterology that during an eighteen-month period, forty-one university students were found to have stomach ulcers.

The average age of the patients was twenty-three, while the youngest was seventeen. All but two were men.

The finding may open new doors for the diagnosis and treatment of both gastric and duodenal ulcers.

Ulcers are characterized by a long history of indigestion and stomach trouble. In these forty-one cases, the patients often had no previous difficulty.

They all responded rapidly to treatment and in one case, the acute stage lasted only six days. This quick recovery made us wonder how often an ulcer, in its early stages, may be overlooked by both the patient and his physician?

Early diagnosis and proper education of the patient can minimize the number and severity of recurrences in later life, and can reduce the possibilities of complications.

# American Medical Association

## Actions of the House of Delegates

### Twelfth Clinical Meeting

Health care of the aged, the report of the AMA Commission on Medical Care Plans, osteopathy, expansion of medical education facilities, the Association's administrative changes, the report of the Committee to Study AMA Objectives and Basic Programs, and voluntary health organization fund raising were among the wide variety of issues considered by the House of Delegates of the American Medical Association's Twelfth Clinical Meeting held December 2-5 in Minneapolis, Minnesota.

The scientific meetings were all held in the Municipal Auditorium and congregated into four procedures, panel discussions, papers, exhibits, from Michigan contributors included the following (all are M.D.'s unless otherwise specified):

John M. Weller, Ann Arbor—Participant, Panel Discussion on "Acute Renal Shutdown"; W. E. Redfern, W. L. Lowrie, M. A. Block and Brock E. Brush, Detroit—"The Care and Treatment of Diabetic Feet"; Russell N. De Jong, Ann Arbor—Participant, Panel Discussion on "Stroke: Hemorrhage, Thrombosis, Spasm?"; John W. Sigler, Detroit—Round Table on "Common Problems in Managing the Arthritic Patient"; William H. Beierwaltes, Ann Arbor—Participant, Panel Discussion on "Diagnosis and Treatment of Thyroid Disease"; William J. Schull, Ann Arbor—Participant, Panel Discussion on "Hazard Versus Diagnostic Yield in Radiologic Procedures."

Franklin V. Wade, Flint—Assistant in Presenting Exhibit on "Fractures Encountered by the Front Seat Passenger in a Crash"; Hubert C. Peltier, Harold L. Upjohn, Robert O. Stafford, and Robert H. Levin, The Upjohn Company, Kalamazoo—Scientific Exhibit, "The Improvement of Steroid Preparations"; W. L. Lowrie, H. L. Johnson, W. E. Redfern, J. B. Bryan, F. W. Whitehouse, and E. A. Kish, Henry Ford Hospital, Detroit—Scientific Exhibit, "Preserving the Diabetic Foot from a Triple Threat"; Donald R. Korst, VA Hospital, and Ronald C. Bishop, Simpson Memorial Institute, University School of Medicine, Ann Arbor—Scientific Exhibit, "Oral Iron Absorption and Iron Depleted Subjects: A Radioisotope Method Using Fe-59"; Frank Cox Jr., E. A. Timm, E. L. Quinn, J. M. Colville and I. William McLean, Henry Ford Hospital, Detroit—Scientific Exhibit, "Adenovirus-A-Serologic Study."

Several Michigan men had somewhat important positions to fill and services to render. William Bromme again served as delegate in place of W. D. Barrett who could not attend. Robert L. Novy, as a member of the Council on Medical Service, had many duties to perform in helping to prepare the reports and resolutions from that Council, including endless hours in writing, rewriting, consulting and finally arriving at the statement of Principles of the American Medical Association in regard to

care of the needy aged. Grover C. Penberthy, Detroit, served as he has for several years, as delegate from the Section on Surgery, General and Abdominal.

The reference committees from the House of Delegates are the groups in which the most important work is done. Resolutions and reports are referred to the reference committees which meet in specified places at specified but long continued hours for the purpose of hearing all discussion and arguments pro and con for the measure under consideration. After this, the committee in executive session determines what report to recommend to the House.

John S. DeTar served as chairman of the Reference Committee on Medical Service, to which were referred many most important problems, including the care of the aging adult citizen. Grover C. Penberthy was chairman of the Reference Committee on Medical Education and Hospitals, to which was referred the resolution on osteopathic status and the various resolutions on payment to house physicians. Both these reports were masterfully done, concise and definite, with specific recommendations.

William A. Hyland, Grand Rapids, was chairman of the Michigan delegation and in almost constant conference with various interests, committees and councils. He was much occupied with the administrative program developing from the Hyland committee report on the Heller report presented to the House a year ago at Philadelphia and last summer at San Francisco.

Lonnie A. Coffin, M.D., of Farmington, Iowa, was named the 1958 General Practitioner of the Year for his outstanding contributions to the health and civic affairs of his home community. Dr. Coffin, who is the first Iowan to receive the annual GP award, accepted his gold medal on behalf of "all the men who have dedicated their lives to the general practice of medicine."

Speaking at the Tuesday opening session of the House, Gunnar Gundersen, M.D., of La Crosse, Wisconsin, AMA President, called upon the medical profession to exert leadership and imagination in meeting the problems of these changing times. Urging practical actions to solve medico-economic challenges, Dr. Gundersen declared that "the time has passed for policies based on generalities, platitudes and flag-waving." He also suggested that the Association offer support and co-operation to proposals for an International Medical Year.



## ACTIONS OF AMA HOUSE OF DELEGATES

Governor Orville L. Freeman of Minnesota, who also addressed the opening session, asked for "the help of the leaders of the medical profession in working out a program that will most adequately meet the needs of our older citizens for health care and services of the highest quality."

With half a day still to go, total registration Thursday evening had reached 4,880, including 2,870 physicians.

### Health Care of the Aged

Responding to Dr. Gundersen's call for action and Governor Freeman's plea for help in meeting the health care needs of the aged, the House of Delegates adopted the following proposal submitted by the Council on Medical Service and endorsed by the Board of Trustees:

"For persons over sixty-five years of age with reduced incomes and very modest resources, it is necessary immediately to develop further the voluntary health insurance or prepayment plans in a way that would be acceptable both to the recipients and the medical profession. The medical profession must continue to assert its leadership and responsibility for assuring adequate medical care for this group of our citizens.

"Therefore, the Council on Medical Service recommends to the House of Delegates the adoption of the following proposal: That the American Medical Association, the constituent and component medical societies, as well as physicians everywhere, expedite the development of an effective voluntary health insurance or prepayment program for the group over 65 with modest resources or low family income; that physicians agree to accept a level of compensation for medical services rendered to this group which will permit the development of such insurance and prepayment plans at a reduced premium rate."

In order to effect the immediate implementation of such a program, the House directed that copies of the proposal be distributed to medical society approved plans, including Blue Shield and Private insurance programs, requesting their co-operation.

### Commission on Medical Care Plans

The long-awaited report of the Commission on Medical Care Plans, appointed at the 1954 Clinical Meeting in Miami, was discussed for two hours at a reference committee hearing, but the House decided to defer action until the June, 1959, meeting. In so doing, the delegates adopted this statement:

"We respectfully suggest to the constituent associations reviewing the report in the interim, that their attitude regarding the report will be clarified if they arrive at some decisions in regard to the following basic points:

"1. *Free Choice of Physician*.—Acknowledging the importance of free choice of physician, is this concept to be considered a fundamental principle, incontrovertible, unalterable, and essential to good medical care without qualification?

"2. *Closed Panel Systems*.—What is or will be your attitude regarding physician participation in those systems of medical care which restrict free choice of physician?

"These suggestions acknowledge that the policy of the

American Medical Association to encourage and support the highest quality of medical care for all patients remains unchanged. They question, however, whether attitudes toward the free choice of physician and the closed panel system may be undergoing evolutionary change."

The House recommended that the Board of Trustees invite the constituent associations to forward their replies to these questions to the Executive Vice President sixty days in advance of the June, 1959, meeting.

### Osteopathy

Considerable discussion centered on a resolution which would have recognized that constituent medical associations have the right to establish the relationship of the medical profession to the osteopathic profession within their respective states. The House decided, however, that the resolution in question did not offer the appropriate solution to the osteopathic problem. Instead, the delegates requested the Judicial Council to review past pronouncements of the House on osteopathy and the status of the laws of the various states in this regard. The Council was asked to present its report and recommendations at the June, 1959, meeting. The House "noted with favor that the American Osteopathic Association has amended its objectives as stated in its constitution by deleting reference to the cultism of Andrew J. Still."

### Medical Education

The House approved a statement by the Council on Medical Education and Hospitals supporting the development of additional facilities for basic medical education, and it urged the entire profession to give that policy strong support in order to correct misinterpretations of the Association's viewpoint regarding the supply of physicians.

"American medicine," the statement points out, "fully recognizes the needs being brought about by the increasing population, social and economic trends, and the changing dimensions of medical knowledge and its application." Urging careful analysis of those needs, the statement says that existing medical schools should consider the possibility of increasing their enrollments and developing new facilities. It also declares that American medicine has the responsibility to encourage the creation of new four-year medical schools and two-year basic science programs by institutions of higher education which can provide the desirable setting.

### AMA Administrative Structure

A Board of Trustees report on the administrative structure of the Association was approved by the House, which termed the reorganization of the headquarters staff as a long and important step in the right direction. The report informed the House that the Chicago staff has been divided into the following seven divisions: Business Division, Law

## ACTIONS OF AMA HOUSE OF DELEGATES

Division, Communications Division, Field Division, Division of Scientific Publications, Division of Socio-Economic Activities and Division of Scientific Activities. The latter two are still in the process of development and are temporarily under the direction of the Assistant Executive Vice President. The Board also reported that the Committee on Legislation has been renamed the Council on Legislation Activities, with the Director of the Law Division as Council secretary. This new council will undertake an enlarged, strengthened legislative program, closely co-ordinated with the activities of the new field staff and the Washington Office. The latter also has been reorganized, with overall direction coming from Chicago.

### AMA Objectives and Basic Programs

The House received and commended the report of the Committee to Study AMA Objectives and Basic Programs, which it said may be a significant milestone in the Association's history. In approving one of the committee's recommendations, the House referred to the Council on Constitution and Bylaws the following suggested amendment of Article II of the Constitution:

"The objectives of the Association are to promote the science and art of medicine and the betterment of public health and an understanding of the socio-economic conditions which will facilitate the attainment of these objectives."

The House also recommended that the Board of Trustees establish a mechanism which will assume the responsibility for promoting active liaison with each national medical society. "In the scientific fields," the House declared, "the role of the AMA should be primarily that of leadership, but every endeavor should be made to bring about co-ordination of the special fields of scientific interest of the other national medical organizations." The delegates also approved a recommendation that the Board of Trustees give serious consideration to opening the publications of the Association to a free and open discussion of socio-economic problems applicable to medicine.

### Fund Raising

Once again considering fund raising problems which have arisen since development of the concept of united community effort, the House passed a resolution which pointed out that the action taken last June in San Francisco has been interpreted by some as disapproving the inclusion of voluntary health agencies in United Fund drives. It then stated that "the American Medical Association neither approves nor disapproves of the inclusion of voluntary health agencies in United Fund drives." The resolution also requested the Board of Trustees to arrange a top-level conference with the voluntary health agencies, the United Funds and other parties interested in the raising of funds for health

causes, with a view toward resolving misinterpretations and other difficulties in this area.

### Miscellaneous Actions

In dealing with a wide variety of other subjects, the House also:

- ... Took notice of the recent restrictive changes in the *Medicare* program; expressed regret at the substitution of federal facilities for private care in the areas mentioned, and urged the Association to encourage the re-establishment of services under the free choice principle to accomplish the original intent of the act.

- ... Recommended that the Social Security Act be amended by Congress to permit states to combine the present four *Public Assistance* medical programs into a single medical program, administered by a single agency and making available uniformity of services to all eligible Public Assistance recipients in the state.

- ... Authorized the Council on Medical Service to sponsor at the earliest practicable date a *Congress on Prepaid Health Insurance*.

- ... Approved a plan to develop "*Buyers' Guides*" which will be sent to physicians to help their patients analyze the merits of available health insurance programs.

- ... Approved a Bylaw amendment which will allow *dues exemptions* for interns and residents serving in training programs approved by the Council on Medical Education and Hospitals.

- ... Called to the attention of all individuals or institutions responsible for *intern and resident* training that medical services provided to patients in hospitals are the responsibility of duly licensed physicians.

- ... Encouraged the voluntary registration of the *paramedical personnel* who assist physicians, but opposed the extension of governmental licensure and governmental registration at this time.

- ... Heartily approved and lauded the purpose, content and format of *The AMA News* and recommended continuance of the publication under its present and established policies.

- ... Agreed with the Committee on Medical Practices that *relative value studies* should be conducted by each constituent medical association but not on a national or regional basis by the AMA.

- ... Urged each constituent society to establish a committee on *rehabilitation* to carry out activities recommended by the Board of Trustees.

(Continued on Page 109)

# Addictions to Alcohol, Narcotics and Barbiturates Among Physicians

## NARCOTIC ANALGESICS AND THEIR ADDICTIVE PROPERTIES

The threat of narcotic addiction is an ever-present problem to the physician administering or prescribing such drugs. It becomes doubly dangerous when the physician, through self-administration of these potentially addicting drugs, unwittingly becomes addicted himself.

The Michigan State Board of Registration in Medicine is concerned over the considerable increase in narcotic addiction among doctors in Michigan. Several doctors have appeared before the Board during the past several years because of addiction to alcohol, narcotics and barbiturates. This serious situation is the result of: (a) a widespread lack of appreciation of the addicting properties of these new narcotic drugs; (b) publicity given to early over-optimistic claims that the synthetic analgesics were non-addictive; and (c) usual lag in appearance of clinical reports attesting to their ability to cause addiction.

It is our desire to alert the physicians in Michigan to this serious problem and to acquaint them with the relative addicting properties of some of the narcotic analgesics. Protect yourself, your fellow physicians, your family and your patients by knowing the facts!

### Classification and Comparison of Addictive Narcotics

The narcotic analgesics belong to two groups:

1. The Opiate Alkaloids: such as morphine and codeine and their synthetic derivatives. Very closely related chemically.
  - (a) Morphine derivatives:
    - (1) Heroin (1910)
    - (2) Dionin or Ethylmorphine (1915)
    - (3) Dilaudid (1926)
    - (4) Metopon (1946)
    - (5) Dromoran (1948)
  - (b) Methadone (Dolophine) (1948)
    - (1) Dihydrocodeinone (Dicodid, 1930, Hycodan, 1940)
    - (2) Dihydrohydroxycodone (Percodan, 1945) (Nucodan, 1948)
2. The Synthetic Analgesics
  - (a) Demerol (1940)
  - (b) Methadone (Dolophine) (1948)
  - (c) Nisentil (1950)

Just what particular actions or effects of a narcotic analgesic are responsible for the development of addiction are unknown. It is true, however, that those narcotics which have a short-lasting duration of analgesic effect are more likely to become addicting, so that a comparison may be made on this basis as has been done here.

JANUARY, 1959

Members of the Michigan State Medical Society  
Dear Doctor:

The Board wishes to inform you concerning a problem which has come to our attention frequently during the past several years. This problem concerns addiction to alcohol, narcotics and barbiturates among the physicians. The Board does not believe that you, as a licentiate of the Board, fully realize the seriousness of the problem.

There has been an increase in the number of revocation hearings conducted by this Board over the past few years which has been based on alcohol, narcotic and barbiturate violations on the part of licentiates. When a licentiate has appeared before the Board, a very firm stand has been taken in the matter of addiction. The license of the individual has been invariably revoked or at least suspended for a period of time.

We wish to emphasize the fact that this Board is primarily concerned with its ability to render to the public and the licentiates the best possible service. We believe with your help and co-operation in this field that progress can be made in eliminating to some degree the problem of addiction of the physician and the patient.

A. Doctors of medicine should conform to all state and Federal narcotic regulations. (A copy of the same is attached).

B. Physicians should know the addictive properties of the various narcotic drugs, also that they be cognizant of the habit forming characteristics of the amphetamines and barbiturates. (A copy of the same is attached).

C. Support programs endeavoring to prevent and cure addiction.

D. If you observe a fellow physician acting as if he might be subject to the use of narcotics, other drugs or alcohol discuss the matter with physicians who are close to him and determine what steps should be taken to assist this individual in seeking the proper medical care.

This problem may seem like it is a distant one, as far as you personally are concerned. The Board believes this is a serious problem. We wish to thank you for your time and trust you will co-operate in this matter so important to everyone concerned.

Sincerely yours,  
MICHIGAN STATE BOARD OF REGISTRATION  
IN MEDICINE  
E. C. SWENSON, M.D., *Executive Secretary*

In the text matter the narcotics are arranged under their classification as synthetic or opium derivatives and are listed approximately according to their relative addicting properties. To support this classification, references are cited at the end of this article.

### Narcotics and Their Addictive Properties

#### I. Synthetic Narcotic Drugs:

1. Meperidine Hydrochloride, U.S.P. XIV Demerol. N.N.R. (Winthrop-Stearns and George E. Breon). Aver. Dose: 50-100 mgs. orally or hypo.

Addiction dangers:

- (a) Analgesic effect only 2-3 hours; frequent medication required.

## ADDICTIONS AMONG PHYSICIANS

- (b) Few side-reactions; feeling of mild elation and well-being.
- (c) Rapid condition-reflex, tolerance, and dependence develops, leading to larger doses, greater tolerance, and definite addiction.
- (d) Doses of 50-100 mgm., orally or by hypo, 4 or more times daily, can produce addiction in cases of chronic pain or opiate habituation, in 2-3 weeks.
- (e) Considered by some authorities as addict-forming as heroin.

2. Methadone Hydrochloride, N.N.R. Dolophine—(Lilly); Adanon H Cl—(Winthrop-Stearns). Aver. Dose: 10 mgs. oral or hypo.

### Addiction dangers:

- (a) Analgesic effect of 4-5 hours.
- (b) Less euphoria than M.S.
- (c) Probably the least addicting synthetic narcotic.
- (d) Doses of 10 mgm., orally or by hypo, every 4 hours, 4 times daily, produce tolerance and addiction in about 6 weeks.
- (e) Less addicting than Morphine or Demerol, but more so than Codeine.

3. Nisentil H Cl, N.N.R. (Hoffmann-LaRoche). Aver. Dose: 40 mgm. in 1 cc. ampuls (hypo only).

### Addiction dangers:

- (a) Short-lasting analgesic 1-2 hours.
- (b) Used mainly during labor.
- (c) Restricted use precludes it from being a narcotic problem.

## II. Opium Derivatives and New Morphine and Codeine Substitutes: (In order of addictive properties).

1. Dihydromorphinone Hydrochloride, U.S.P. Dilaudid (Bilhuber-Knoll).

- (a) Analgesic action of 3-4 hours at best.
- (b) More rapidly addicting than Morphine.
- (c) Doses of 1/16 gr. (4 mgm.) 4-5 times daily produce rapid addiction.
- (d) Sl. lower incidence side effects but more euphoric than morphine.  
Best used in chronic pain or the terminal carcinoma patient when M.S. is no longer effective in 1/2 gr. (30 mgm.) doses, or where less objectionable side effects are sought.

2. Morphine

- (a) Less addictive than dilaudid.
- (b) Analgesia lasts 5 hours.
- (c) Tolerance develops rapidly.
- (d) Oral use—too many side effects.

3. Methorphan Dromoran (Hoffmann-LaRoche). Aver. Dose: 5 mgms. Two forms are now in use, the dldromoran and the newly introduced I-dromoran.

- (a) Less addictive than morphine.
- (b) Long-lasting analgesia—5-6 hours.
- (c) Few undesirable side effects.
- (d) Tolerance and addiction develop slowly in chronic pain patients.
- (e) No cases of "primary" addiction yet seen.

4. Metopon, N.N.R. (Parke, Davis & Sharpe & Dohme). Aver. Dose: 6 mgms. (Oral Capsule only).

- (a) About similar to or less addictive than Dromoran.
- (b) Available only in capsule form.

- (c) Tolerance develops slowly and is rapidly broken upon cessation of drug for 1-2 days.
- (d) Low incidence side effects and euphoria.

### 5. Codeine Derivatives.

- (A) Dihydrocodeinone.  
Dihydrocodeinone Bitartrate, N.N.R.  
Hycodin—(Endo).  
Dicodid—(Bilhuber-Knoll).  
Aver. Dose: 4 mgs. (for cough); 10 mgs. (for pain).  
(a) N.N.R. says on basis of weight, more addicting than codeine.  
(b) No advantages over codeine as cough suppressant.
- (B) Dihydro-Hydroxy Codeinones  
Percodan—(Endo). Aver. Dose: 1-2 Tabs. 3-4x/day.  
(a) More addictive than similar ASA Cmpd. with codeine grs. 1/2.  
(b) Includes homotropine as a mild antispasmodic and anti-emetic agent.
- (C) Nucodan—(Endo).  
(a) Perhaps sl. less addictive than ASA Cmpd. No. 3.  
(b) Contains metrazol as a mild respiratory stimulant.

## Selected References

1. (Codeine) Gruber, C. M. and Nelson, G. M.: Codeine addiction. *Ann. Int. Med.*, 29:151 (July) 1948.
2. (Demerol) Isbell, H.: The newer analgesic drugs: their use and abuse. *Ann. Int. Med.*, 29:1003 (Dec.) 1948.
3. *Dolophine (Methadone)* Isbell, H., et al: Narcotics, tolerance and addiction liability of methadone. *J.A.M.A.*, 135:888 (Dec. 6) 1947.
4. (Dromoran) Fraser, H. F. and Isbell, H.: Addiction liabilities of morphinan and dihydrocodeinone. *J. Pharm. Exp. Thera.*, 100:128 (Oct.) 1950.

Compiled jointly by the Liaison Committee of the Michigan State Board of Pharmacy and the Michigan State Medical Society at the request of the Michigan State Board of Registration in Medicine.

## DIGEST OF FEDERAL AND STATE LAWS AND REGULATIONS RELATING TO NARCOTICS AND BARBITURATES

**Recommendation.**—The responsibility for the prescribing and dispensation of narcotics, drugs and barbiturates is upon the physician, but a corresponding responsibility rests with the pharmacist who fills the prescription. An understanding of mutual problems will result in more improved medical care.

### Narcotics

#### I. Prescription

- A. Must be written in ink, or indelible pencil, or, if typewritten, must be signed in ink or indelible pencil.
- B. Must contain:
  1. Name and address of physician and designation of healing art.
  2. Physician's narcotics registry number.
  3. Name and address of patient; if transient or traveler, immediate local address at the time of prescribing.

## ADDICTIONS AMONG PHYSICIANS

4. (a) Name of narcotic.
- (b) Weight and quantity.
- (c) Followed by directions for use.
5. Date and signature as of date issued.

### II. Exempt Narcotic Preparations

#### A. Refilling:

##### 1. Michigan law:

- (a) Those containing no more than one grain of codeine or its salts in one avordupois ounce may be refilled by the pharmacist with the sanction of the physician. All other narcotics as listed by the Federal law are to be filled only once from the original written prescription.

### III. Office Supply

- A. Official order form must be employed. It is illegal to procure by writing prescription for hypothetical person or for "self."

### IV. Office Record

#### A. Physician:

1. Must for two years keep a record of all narcotics dispensed and retain duplicate order forms.
2. Record must contain:
  - (a) Name of drug.
  - (b) Quantity.
  - (c) Name and address of patient; as above.
  - (d) Date of issuance.
3. Exception:
  - (a) No record required when drug is personally administered by physician.
  - (b) Pharmacist:
    - (1) Must retain all prescriptions and duplicate order forms for two years.

### V. Lawful Prescribing

- A. Narcotics are to be prescribed only for legitimate medicinal purposes. They may be also prescribed in any amount in the case of incurable diseases according to accepted medical practice.

### VI. Unlawful Prescribing and Dispensing

#### A. Addicts:

1. It is illegal to prescribe or dispense narcotics to gratify addiction.

#### B. Telephone orders:

1. It is illegal to prescribe or receive prescription for narcotics over the telephone unless the pharmacist receives the signed prescription before or at the time of delivery of the medication.

### VII. Prescription Pads

- A. It is suggested that these should never be left where they can be stolen. Addicts are on the lookout for loose pads which enable them to forge prescriptions.

## Barbiturates

(Michigan Law)

### I. Prescription

- A. It is unlawful for the pharmacist to dispense any drug commonly referred to as barbiturates in any manner other than upon written order.
- B. Must contain:
  1. Follow substantially requirements as to narcotics prescriptions.

### II. Exempt Barbiturate Preparations

#### A. Refilling:

1. Drug phenobarbital and preparations containing phenobarbital must be dispensed originally on prescription but may be refilled provided caution is used.
2. All other barbiturates are to be filled only once from the original written prescription.

### III. Office Record

#### A. Pharmacist:

1. Must retain all prescriptions for two years.
2. Must maintain a record of number and quantity of refills of phenobarbital prescriptions.

### IV. Unlawful Prescribing and Dispensing

#### A. Telephone orders:

1. Written order must be retained by pharmacist for all barbiturates dispensed.

(Compiled by Michigan State Board of Pharmacy at request of Michigan State Board of Registration in Medicine)

## ACTIONS OF AMA HOUSE OF DELEGATES

(Continued from Page 106)

... Called for continued activity at all levels to stimulate the development of effective *poliomyelitis inoculation programs*.

... Suggested that the Association take immediate steps toward developing a plan whereby reserve medical units and individuals not immediately involved in military operations could be used to supplement *civil defense* operations.

... Expressed gratitude and appreciation for the long years of devoted service by *Dr. Austin Smith*, who has resigned as Editor of *The Journal of the American Medical Association*.

At the opening session, six state medical societies contributed a total of almost \$250,000 to the American Medical Education Foundation. The gifts were: California, \$150,305.75; Indiana, \$35,110; New Jersey, \$25,000; New York, \$19,608; Utah, \$9,977.50 and Arizona, \$8,657.50. In addition, the American Medical Association announced a contribution of \$100,000 to the Foundation.

It also was announced on the opening day of the meeting that *W. Linwood Ball, M.D.*, of Richmond, Virginia, AMA Vice President, had been appointed to the Board of Trustees to fill the vacancy caused by the recent death of *Warren Furey, M.D.*, of Chicago. *Dr. Ball*, who will serve on the Board until next June, said he will not be a candidate to succeed himself.

For portions of this report, we are indebted to *F. J. L. Blasingame, M.D.*, Executive Vice President, American Medical Association.



# Michigan's Department of Health

Albert E. Heustis, M.D., Commissioner

## HOW HEALTH ADDS UP

### Highlights of 1959-60 Budget Request

Public health in Michigan has established a good record, stretching back over eighty-five years. However, our immediate concern is with our failures and what can be done about them. The following are some highlights from the Michigan Department of Health Budget Request for 1959-60—six proposals signed out which would tackle some of our worst shortcomings.

### Crippling Polio

A survey made by local health departments shows protection for school children ranging from 38 per cent in one area to 96 per cent in another. Protection for adults ranges from 11 to 28 per cent. An over-all estimate:

Protection with Three Doses of Vaccine	
	Per Cent
Age through Fours Years .....	43%
Five through Fourteen .....	75%
Fifteen through Forty .....	20%

We now know we need 80 per cent to 90 per cent protection. We need a renewed campaign to make polio immunization readily available through private physicians and local health clinics—the same pattern which has worked so well for so many years against other diseases. We recommend:

*Immediate*—\$400,000 appropriation to provide polio vaccine for use through physicians and local public health clinics before the next polio season starts in mid-June. This vaccine to be used to immunize pre-school children—the high risk group.

*Next Year*—\$400,000 appropriation to buy polio vaccine in 1959-60, with continued emphasis on immunizing children. If a quadruple vaccine becomes possible, these funds to be used as needed to buy polio vaccine for combination with products we now produce.

### Sanitation

People have broken down old sanitation safeguards. They have pushed out farther than sanitation facilities reach. Health department services are not keeping pace. We are behind in supervising water supplies—in assuring safe sewage treatment—in supervising trailer parks. As a minimum to help meet the need, we recommend: Five added engineers, plus travel: \$39,679.

### Old and Sick Number 18,000

Many homes and institutions for the sick and aged offer good care, support further improvement and fully co-operate with community and state groups. Some offer bleak surroundings with storage described as care. A few are intolerable. Department responsibilities include helping local departments supervise homes and directly approving nursing care standards in 130 homes,

sanitation facilities in 149 homes and plans in 277 homes. The problem is a big one and it is growing. Minimum needed: \$48,265.

### Long-Term Illness

Long-term illness confines increasing numbers to home-bound and bedfast worlds. Many times this could be avoided or postponed. We propose that specialists be hired to conduct patient evaluation clinics upon the request of physicians and local health departments. This would help introduce new care techniques, help cut expensive hospital bills for taxpayers. Also needed is better understanding of chronic diseases, the importance of early detection and the returns from low-cost home nursing care. Minimum required: \$23,146.

### Radiation and Other Industrial Dangers

Under recently adopted radiation regulations, the Department is called upon to help health professions and industry safeguard some 10,000 x-ray machines and to give supervision to the use of radioactive substances and nuclear reactors. In addition there are air pollution hazards, dangers from poisonous sprays, explosive plastics and other chemical and industrial processes. Available manpower cannot keep up with the work needed to protect against such hazards. Minimum needed: 2 added engineers: \$17,200.

### Local Nursing and Sanitation Services

Strong local health departments are the core of effective public health practice. Today many departments are crippled by lack of funds. They must be reinforced if we are to meet public health needs. A Citizens Community Health Advisory Committee, after intensive evaluation, recommended: "\$500,000 for state assistance for local health departments for 1959-60 instead of \$319,500 provided this year, and further added funds be made available to areas of greatest financial need." Proposed distribution plan:

*Basic Grant*—\$315,000 to provide \$4,500 per county for each of the 70 counties contributing to support of a county or multi-county health department—same per county as this year.

*Special Need*—\$185,000 to 48 counties sharing in support of multi-county health departments. Grant would not exceed an added \$4,500 in any county and would be based upon work programs in basic sanitation or nursing.

All but four of the forty-eight counties are in the upper part of Michigan. There are only twenty-eight sanitarians and seventy-three nurses serving a population of over 800,000 plus thousands of tourists in this large area. The request is based upon getting practical basic

(Continued on Page 130)

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smooth  
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- controls  
*stress*
- relieves  
*distress*

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**Pro-Banthine—**  
*unexcelled for relief of cholinergic spasm—*  
has been combined with

**Dartal—**  
*new, well-tolerated agent for stabilizing emotions—*  
to provide you with

**Pro-Banthine with Dartal—**  
for more specific control of functional gastrointestinal  
disorders, especially those aggravated by emotional  
tension.

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**SEARLE**

# SPONTIN IN SERIOUS

*A Special Report from Abbott  
to the Medical Profession  
on a Year's Clinical Experience  
with SPONTIN®  
(Ristocetin, Abbott)*

In a Spanish province, a patient lay dying of endocarditis. A short wave radio appeal for SPONTIN was intercepted by a Baltimore physician. The antibiotic was immediately flown to this faraway land, and 10 days later—the patient had recovered.

In Chicago, a moribund patient had been administered 18 combinations of 10 different antibiotics without success. Involved was a hospital-acquired staphylococcal pneumonia—plus complications. SPONTIN was substituted and the patient lived.

A five-week-old infant was critically ill with staphylococcal enteritis. Treatment failures included erythromycin and chloramphenicol. Three days of SPONTIN saved this life. The list is long and impressive and it grows daily.

Recently, a study<sup>1</sup> was made of serious and resistant staphylococcal infections reported to Abbott Laboratories. Many of these cases had serious complicating diseases—many were moribund, or almost so, at the time SPONTIN was started. Yet, out of the 160 staphylococcal cases studied, 93 were reported cured and 38 improved after the administration of SPONTIN.

Out of the total of 251 patients with severe infections caused by gram-positive or mixed organisms, 149 were reported cured and 53 others improved. And the record for pediatric practice was every bit as good.

Additionally, SPONTIN continues to exhibit exceptional bactericidal activity against coccal infections<sup>2</sup>. And, according to another study, SPONTIN provides successful short-term therapy in endocarditis<sup>3</sup>.

Only last October, at the Antibiotics Symposium in Washington, D. C., a panel of six leading antibiotic experts placed SPONTIN at the top of all other commercially-available antibiotics for treating serious staphylococcal infections. Also, six papers—all dealing with the effectiveness of ristocetin (SPONTIN®) in treating staphylococcal infections—were presented at the Symposium.

One of the most encouraging aspects of the year's literature on SPONTIN is the increasing testimony to its safety. As the months have passed and cases have accumulated by the hundreds, it has become apparent that careful attention to dosage recommendations has practically eliminated toxicity and side effects as serious obstacles to therapy. Also, recent improvements have been made in the manufacture of SPONTIN; the drug is now made from pure crystals.

A recent report<sup>4</sup> in the *Journal of the American Medical Association* concluded, "It is our opinion that, if proper precautions are observed, ristocetin is a [well tolerated] and potent agent to employ in the treatment of staphylococcal infections." And in another study, after successfully treating 28 patients with a variety of staphylococcal infections, the authors reported<sup>5</sup>, "No serious complications were noted."

Few more dramatic records have been written in such a short space of time. SPONTIN has proved itself to be a good answer, perhaps the best answer at present, to the resistant staphylococcal problem — and of real value in other serious coccal infections. It may well be your answer when you're confronted with a serious infection.

Abbott

# STAPHYLOCOCCAL INFECTIONS

## *Excerpts from Reports Read at the Antibiotics Symposium*

### **Spontin In Treating Severe Respiratory Infections**

"In 13 of 20 patients the results were excellent, with clinical response being evident within one to four days after institution of therapy. In three additional patients, there was some degree of improvement in pneumonic processes superimposed on tuberculosis in two cases and on pulmonary neoplasm in one. In all other cases, serious antecedent pathology undoubtedly influenced the negative or equivocal response to ristocetin therapy.<sup>6</sup>"

**Spontin In Treating Staphylococcal Infections**—After successfully treating 28 patients, the authors wrote, "Ristocetin or Spontin has proved to be bactericidal and bacteriostatic, particularly for the *Staphylococcus aureus*, which is often resistant to many other antibiotics.<sup>5</sup>"

**Spontin In Treating Seven Difficult Cases** — "Ristocetin has produced excellent results in eradicating, mitigating or preventing infection in seven selected difficult cases. Six of the seven cases involved *Staphylococcus aureus* which did not respond to chemotherapy with other antibiotics.<sup>7</sup>"

**Spontin Blood Levels In Children** — "Ristocetin was administered as a single intravenous injection of 12.5 milligrams per kilogram. This resulted in serum levels ranging from 1.3 to 10.6 mcg. after two hours with a gradual fall to a level of 0.7 mcg. per cubic centimeter or less after 12 hours.<sup>8</sup>"

### **Spontin In Treating Staphylococcal Pneumonia**

"Ristocetin was used in the treatment of 24 patients with staphylococcal pneumonia, 17 of whom had failed to respond to previously administered antibiotics. Complete clearing of pneumonitis was obtained in 16 patients and significant improvement occurred in two others. Two patients died of pneumonia; four others succumbed to other lethal diseases.<sup>9</sup>"

**Spontin In Treating Children and Adults** — "Ristocetin completely controlled severe staphylococcal infections in 11 adults and six children who received adequate therapy.<sup>10</sup>"

1. Totals represent published reports and personal communications to Abbott Laboratories.
2. Sixth Annual Symposium on Antibiotics, Washington, D. C., Oct. 15, 16, 17, 1958.
3. Romansky, M. J., and Holmes, R., Successful Short-Term Therapy of Enterococcal and Staphylococcal Endocarditis with Ristocetin—Seven Patients. Preliminary Report, Antibiotics Annual, 1957-58, p. 187.
4. J. A. M. A., 167:1584, July 26, 1958.
5. Bush, L. F., et al., The Use of Ristocetin (Spontin) in Staphylococcal Infections, In Press, Antibiotics Annual, 1958-59.
6. Billow, F. J., et al., Clinical Observations on Ristocetin—A Preliminary Report on its Efficacy and Toxicity in 20 Unselected Severe Respiratory Infections, In Press, Antibiotics Annual, 1958-59.
7. Miller, J. M., et al., Ristocetin in the Treatment of Seven Selected Difficult Cases, In Press, Antibiotics Annual, 1958-59.
8. Asay, L. D., et al., Ristocetin Serum Levels in Children, In Press, Antibiotics Annual, 1958-59.
9. Schumacher, L. R., et al., Experiences with Ristocetin in Staphylococcal Pneumonia: Observations in 23 Cases, In Press, Antibiotics Annual, 1958-59.
10. Terry, R. B., Ristocetin in Children and Adults, In Press, Antibiotics Annual, 1958-59.



## NEWS MEDICAL

### MICHIGAN AUTHORS

Mathew Alpern, Ph.D., Paul Ellen, Ph.D., and Robert I. Goldsmith, M.D., Ann Arbor, are the authors of an article entitled "The Electrical Response of the Human Eye in Far-to-Near Accommodation," published in the *AMA Archives of Ophthalmology*, October, 1958.

Edward A. Wishropp, M.D., Detroit, is the author of an article entitled "Changing Trends in Pediatric Practice," presented before the Detroit Academy of Medicine, December, 1957, and published in *Harper Hospital Bulletin*, September-October, 1958.

Louis A. Schwartz, M.D., Detroit, is the author of an article entitled "Application of Psychosomatic Concepts by a Liaison Psychiatrist on a Medical Service," published in *Harper Hospital Bulletin*, September-October, 1958.

Ralph Johnson, M.D., Detroit, is the author of an article entitled "The Economic Advantages of Private Practice," published in *Harper Hospital Bulletin*, September-October, 1958.

Geoffrey Falkson, M.B., Ch.B. and Boy Frame, M.D., Detroit, are the authors of an article entitled "Phosphate Diabetes," published in *Henry Ford Hospital Medical Bulletin*, September, 1958.

Thomas Baumgartner, M.D. and J. Martin Miller, M.D., Detroit, are the authors of an article entitled "A Previously Unreported Effect of the Prolonged Administration of Desiccated Thyroid," published in *Henry Ford Hospital Medical Bulletin*, September, 1958.

John W. Ditzler, M.D., Detroit, is the author of an article entitled "Physiological Trespass in Anesthesia," published in *Henry Ford Hospital Medical Bulletin*, September, 1958.

Ernest W. Reynolds, Jr., M.D. and Franklin D. Johnston, M.D., Ann Arbor, are the authors of an article entitled "The Management of the Cardiac Arrhythmias," published in *GP*, November, 1958.

Fred M. Davenport, M.D., is the author of an article entitled "Vaccination Against Respiratory Diseases Caused by Viruses," published in *THE JOURNAL* of the Michigan State Medical Society and condensed in *American Practitioner and Digest of Treatment*, November, 1958.

Harry Lamb, M.D., is the author of an article entitled "The Use of Nisentil in General Practice," published in *THE JOURNAL* of the Michigan State Medical

Society, and condensed in *American Practitioner and Digest of Treatment*, November, 1958.

Gordon C. Brown, ScD., is the author of an article entitled "Current Investigations of Immunization Against Poliomyelitis," published in *THE JOURNAL* of the Michigan State Medical Society, and condensed in *American Practitioner and Digest of Treatment*, November, 1958.

\* \* \*

Russell Meyers, M.D., one of the world's outstanding neurosurgeons, of the State University of Iowa Medical School, addressed students, faculty and guests of the University of Michigan Medical Center, November 13, on the subject of cerebral palsy. Dr. Meyers is a member of the Society of Neurological Surgeons, of the advisory council on neurosurgery of the American College of Surgeons, and of numerous medical and research associations. He is chairman of the Division of Neurosurgery at Iowa and has specialized in this field since graduating from Cornell Medical College in 1932.

Surgeons at the University of Michigan say there is widespread professional interest in Dr. Meyers' current research. He is seeking to control abnormal movements (such as those caused by cerebral palsy and Parkinson's disease) by using supersonics to create lesions in the brain. His talk was co-sponsored by the University of Michigan Medical Center and the United Cerebral Palsy Association of Michigan.

\* \* \*

Approval of a proposed affiliation agreement between Wayne State University and Sinai Hospital has been given by the University's Board of Governors.

With the acceptance of Sinai as an affiliate, the College of Medicine now has three private Detroit Hospitals available for all phases of teaching, research, and patient care. The other private affiliates are Children's Hospital of Michigan and Harper Hospital. Grace and Detroit Memorial Hospitals have had departmental arrangements with the College of Medicine for several years.

Public hospitals used extensively by the College of Medicine for teaching are Detroit Receiving, Herman Kiefer, and the Veterans Administration Hospital in Dearborn.

Sinai is a 230-bed hospital located in northwest Detroit. Stipulations of the agreement will be maintained through a permanent standing committee appointed jointly.

\* \* \*

**Managing Breast Cancer.**—Oral administration of hydrocortisone has proved successful in relieving some

JMSMS



women sufferers of advanced breast cancer, three surgeons from the University of Michigan Medical Center reported, November 20, 1958, before a meeting of the Western Surgical Society at the Mayo Clinic. George E. Block, M.D., one of the researchers, said that some patients who received at least 100 milligrams of the chemical each day underwent remissions.

Five women whose ovaries had previously been removed were studied. Four received relief ranging from three months to over thirteen months, in the form of "renewed vigor, increased appetite and a general sense of well being." Relief paralleled a drop in the excretion of estrogens normally created by the adrenal glands. The drop was brought about by hydrocortisone.

Heretofore, surgical removal of the adrenal glands was one of the chief methods of bringing relief to women with advanced breast cancer. However, the general condition of some patients prevents surgery. Hydrocortisone can then be used in the treatment of these patients to achieve similar results.

\* \* \*

**University of Michigan Theratron.**—A powerful new charge of radioactive cobalt was loaded into the "Theratron" at the University of Michigan Medical Center in December. It contains 2,000 curies of radioactivity, equivalent in power to \$75,000,000 worth of radium.

Specialists estimate the delicate transfer will take about six hours. The "hot" charge will replace the

original source which has been in constant use for the past four years.

Charles S. Simons, Ph.D., of the Medical Center, will visit the Atomic Energy Commission's reactor at Oak Ridge, Tennessee, early this month to supervise the placement of the new source into a protective casing.

The piece of cobalt, about the size and weight of nine copper pennies, is so potent it must be guarded by two tons of lead during its trip to the University.


\* \* \*

**Symposium on Trauma.**—More than 250 Michigan doctors attended the Seventh Annual Symposium on Trauma, December 3, at the Wayne County Medical Society's headquarters. Sponsors were Wayne State University College of Medicine and the Michigan Committee on Trauma of the American College of Surgeons.

Actual problem cases of hand, facial and knee injuries were moderated in the morning sessions by Joseph Posch, M.D., William Lange, M.D., and A. Jackson Day, M.D. Consultants for these sessions were: Michael Mason, M.D., Chicago, and Harold Woughter, M.D., Flint—hand injuries; Wallace Steffensen, M.D., Grand Rapids—facial injuries; Maurice Castle, M.D., and Joseph Fleming, M.D., Detroit—knee injuries.

Michael Mason, M.D., internationally known authority, spoke on "Tendon Injuries of the Hand."


Others who spoke in the afternoon sessions were Bernard Krakauer, M.D., Highland Park General Hospital; John Lichtwardt, M.D., Wayne County General Hos-



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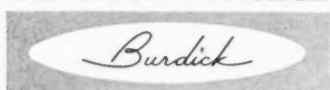
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Hyoscyamine Sulfate . . . . .	0.031 mg.
<b>plus</b>	
Propenpyridamine Maleate . . . . .	12.5 mg.
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pital; Gordon Simpson, M.D., Bon Secours Hospital; William Lange, M.D., Grace Hospital; Donald Economy, M.D., Providence Hospital and H. M. Frost, M.D. and Robert S. Knighton, Henry Ford Hospital.

\* \* \*

**Blood Analysis.**—A machine which handles many of the monotonous tasks in laboratory blood testing is being used at the University of Michigan Medical Center. Chemical analysis of blood has long proved valuable in detecting many human diseases. Yet, until recently, this job has been one of the most tedious chores of laboratory technicians. The new machine automatically analyzes blood.

One girl can run 200 or more blood tests a day in the laboratory by machine, compared with three girls doing the same number of tests a day by hand. "Some tests can still be done better by hand," Professor Chandler said. "The machine has taken over the monotonous, routine work, leaving technicians time for handling the more complicated tests. It represents the beginning of what may be a very big change in chemical testing."

\* \* \*

**The Gordon B. Myers Award in Internal Medicine** has been established at Wayne State University College of Medicine in recognition of Dr. Myers' inspiring leadership as Chairman of the Department of Medicine for over twenty years. The Award has been made possible by contributions from former residents and fellows who received postgraduate training under Dr. Myers. An Award of one hundred dollars and a scroll is to be made annually to the graduating senior who has distinguished himself above all others in his class in courses given by the Department of Medicine. The recipient of the award will be chosen by the chairman and the full-time faculty of the Department of Medicine.

\* \* \*

**The Fellows Medical Manufacturing Company**, an old established institution, has moved its complete operation from New York City to Detroit, Michigan, after operating from Christopher Street, famous Greenwich Village landmark, for the last ninety-four years.

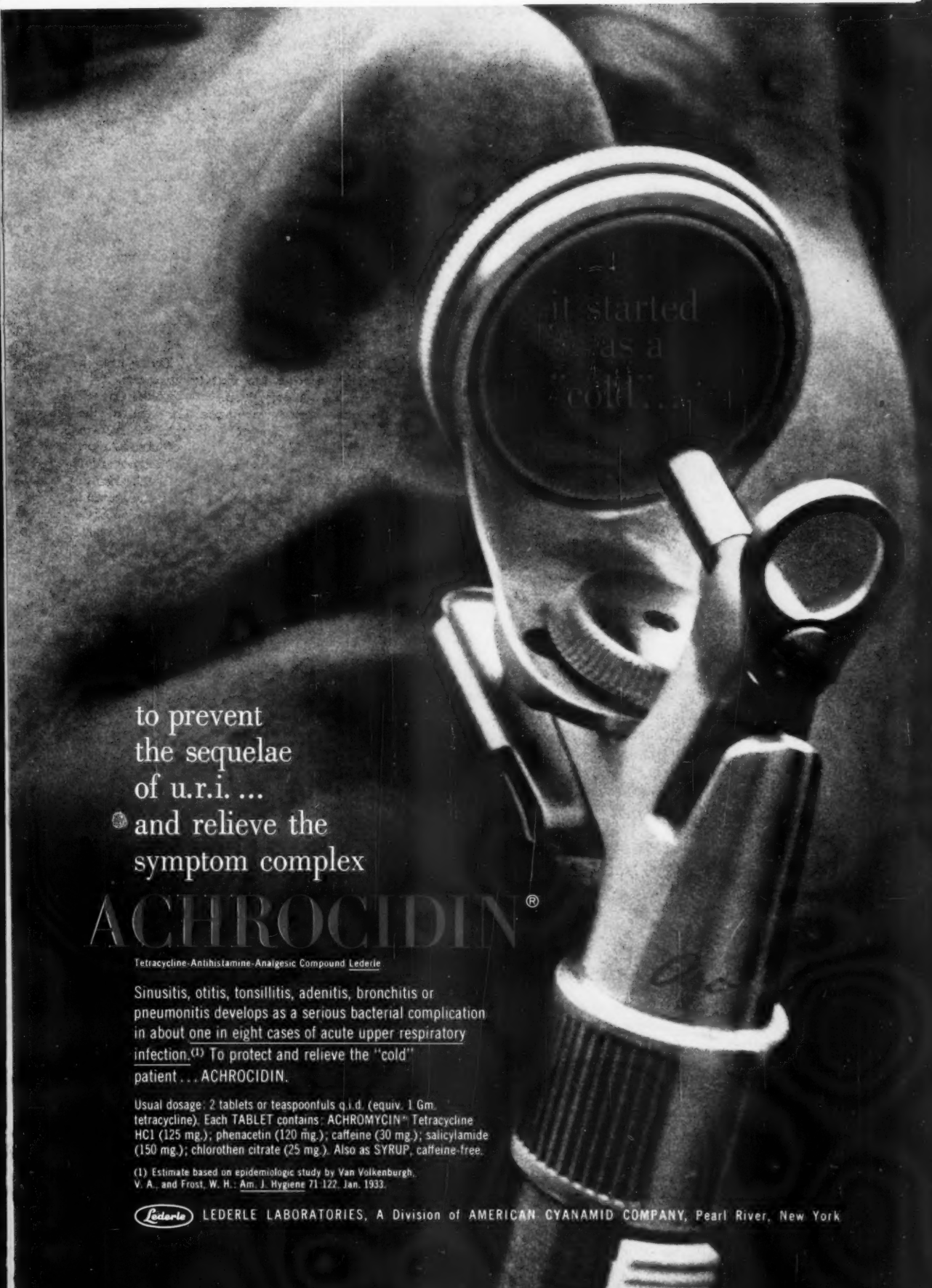
Taking over the complete operation, manufacturing and executive staff, under an agreement is Testagar & Company, Inc., pharmaceutical chemists of Detroit. Sid Heinrich, president of Testagar, who will also assume the posts of general manager and treasurer of the Fellows Company, stated that both companies will operate from 1354 W. Lafayette, Detroit, headquarters of Testagar & Company.

The Fellows Company, which started its medical products manufacturing back in 1866, is one of the country's oldest ethical pharmaceutical manufacturers. Its most famous product is Fellows Syrup, a worldwide tonic that doctors have been prescribing over the many years of Fellow's operation.

\* \* \*

**American Board of Obstetrics and Gynecology.**—The next scheduled examinations (Part II), oral and clinical for all candidates will be conducted at the Edgewater Beach Hotel, Chicago, Illinois, by the entire Board from May 8 through 19, 1959. Formal notice of the exact

(Continued on Page 118)



to prevent  
the sequelae  
of u.r.i. ...  
and relieve the  
symptom complex

## ACHROCIDIN®

Tetracycline-Antihistamine-Analgesic Compound Lederle

Sinusitis, otitis, tonsillitis, adenitis, bronchitis or pneumonitis develops as a serious bacterial complication in about one in eight cases of acute upper respiratory infection.<sup>(1)</sup> To protect and relieve the "cold" patient... ACHROCIDIN.

Usual dosage: 2 tablets or teaspoonfuls q.i.d. (equiv. 1 Gm. tetracycline). Each TABLET contains: ACHROMYCIN® Tetracycline HCl (125 mg.); phenacetin (120 mg.); caffeine (30 mg.); salicylamide (150 mg.); chlorothen citrate (25 mg.). Also as SYRUP, caffeine-free.

(1) Estimate based on epidemiologic study by Van Volkenburgh, V. A., and Frost, W. H.: *Am. J. Hygiene* 71:122, Jan. 1933.



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PRESSURIZED CARTRIDGE**

Contains Halon<sup>®</sup> (dichlorodifluoromethane),  
4% of inspired air.

**replaces oxygen and  
compressed air propulsion**

Cartridge lasts from 5 to 7 days at rate of half-hour intermittent inhalation three times daily; operates any standard nebulizer with suitable hose attachment. Only \$5. for nebulizer; \$2. for cartridge, 16 oz.

\* Intermittent-Long-Term inhalation (as opposed to continuous flow inhalation); saves medication.

**NOBLE-BLACKMER, INC.**  
253 W. Michigan Avenue, Jackson, Michigan

(Continued from Page 116)

time of each candidate's examination will be sent him in advance of the examination dates.

Candidates who participated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible.

Current Bulletins of the American Board of Obstetrics and Gynecology, outlining the requirements for application, may be obtained by writing to the Secretary, Robert L. Faulkner, M.D., 2105 Adelbert Road, Cleveland 6, Ohio.

\* \* \*

Emory W. Morris, president of the W. K. Kellogg Foundation, has been named to a federal group studying ways the nation can be assured of having enough qualified physicians over the next twenty years.

Frank Bane, former executive secretary of the Council of State Governments, was named chairman of the seventeen-man group. The only other Michigan man listed was Douglas E. H. Williams of Ann Arbor, executive secretary of the Dunbar Community Assn.

Surgeon-General Leroy E. Burney of the Public Health Service suggested that the group might recommend actions which could be taken to achieve reasonable goals in medical manpower over the next ten to twenty years. —*Battle Creek Enquirer-News*, November 27, 1958.

\* \* \*

**Effects of Radiation.**—The Surgeon General of the U. S. Public Health Service, speaking before a capacity crowd at the University of Michigan School of Public Health, stressed the need for long-range studies of the effects of radiation. Leroy E. Burney, M.D., explained that "at the present time we cannot tell people what their tolerance for radiation is or what they should do about radiation fallouts."

Some research projects have been started on the subject, he said. "One alert public health officer noted that successive deaths from cancer were occurring in the same homes. He discovered that these houses contained a high rate of radiation."

But Dr. Burney pointed out, "The bridge between research and its application is too long. Public health workers must use imagination in meeting the challenge offered by radiation."

\* \* \*

**Baker Memorial Lecture.**—The annual memorial lecture honoring Henry Baker, M.D., a pioneer in public health work in the state of Michigan, will be given December 8 at the University of Michigan School of Public Health.

The speaker will be Stuart Willis, M.D., former superintendent of the Maybury Sanatorium at Northville, Michigan, and now associate professor of medicine at the University of North Carolina and medical director of the North Carolina Sanatorium System.

\* \* \*

**Clinical Director Appointed.**—M. Duane Sommersness, M.D., Medical Superintendent of the Traverse City State Hospital, announces the appointment of Arthur F. Dundon, Sr., M.D., as Clinical Director for the Traverse

(Continued on Page 120)

*in*  
**URTICARIA**  
*Family Physicians*  
*use*

**specific  
desensitization  
for**

**\*lasting immunity**

**... easily, pleasantly and economically**

**SPECIFIC DESENSITIZATION . . .**

is easily accomplished, quickly and accurately by any physician. Simply scratch test each patient by using activated Barry allergens to determine what offends the patient. Then send a list of these offenders with their reactions to Barry for the preparation of a specific desensitization formula which promotes *lasting active immunity*. For scratch testing your patients, request the specific assortment of activated allergens which may include foods, epidermals, dusts, fungi, bacteria or pollens. A brief history of your patient will permit us to select the assortment your patient requires. This is a safe, simple, time-proven technique and comes to you complete with directions for use by your nurse.

**LASTING ACTIVE IMMUNITY . . .**

is obtained by desensitizing your patient for the specific irritants to which your patient reacted by the scratch test. Each desensitization formula is individually prepared for each patient according to his own needs based upon the list of irritants that you supply and the degree of reaction for each. Specific desensitization against irritants such as foods, epidermals, dust, fungi, bacteria and pollens immediately *promotes active immunity* lasting longer than any other known medication. Each specific treatment is prepared in a three vial serial dilution set (20 doses) and includes a personalized treatment schedule indicating the correct interval to use between injections. For your patients that have already been skin tested by any means, simply send their list of offenders to the Allergy Division. Prompt 7-10 day service on all Rx's.

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**For the nurse**  
ALLERGY TESTING, A MANUAL FOR  
THE NURSE ASSISTANT

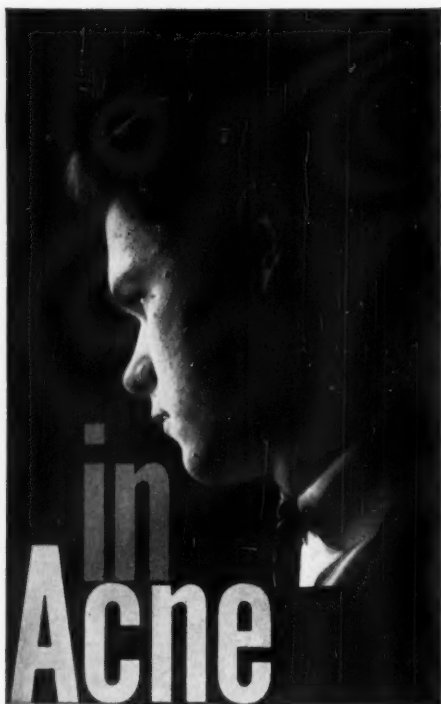
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"No patient failed to improve."

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*pHisoHex* maintains normal skin pH, cleans and degerms better than soap. In acne, it removes oil and virtually all skin bacteria *without scrubbing*.

For best results—four to six washings a day with *pHisoHex* will keep the acne area "surgically" clean.

1. Hodges, F. T.: *GP* 14:86, Nov., 1956.

# pHisoHex®

Sudsing  
nonalkaline  
antibacterial  
detergent—  
nonirritating,  
hypoallergenic.  
Contains 3%  
hexachlorophene.

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(Continued from Page 118)

City institution. Dr. Dundon comes to Traverse City State Hospital from Menninger Clinic, Topeka, Kansas.

\* \* \*

The New York State Medical Society on December 1, announced the appointment of a new Executive Director of the Medical Society of the State of New York, Dr. Herbert T. Wagner of Bronxville, a forty-six-year-old physician who will assume part of the duties of W. P. Anderson, M.D., who will continue as Secretary, a position he has held for many years.

\* \* \*

The American Federation of Government Employees, along with other union groups, is making its prime legislative goal for 1959, the enactment of medical care insurance for some five million Federal employees and dependents. The present strategy is for employees to demand that the government pay full premium for major medical or catastrophic expense coverage and assume at least 50 per cent of the cost of basic health insurance, including hospitalization benefits. Health insurance for these groups has been under consideration for several years through Blue Cross-Blue Shield, but this amount of government donations is new.

\* \* \*

Norman F. Miller, M.D., chairman of the Department of Obstetrics and Gynecology at the University of Michigan Medical Center, served as visiting professor at Indiana University School of Medicine November 10-15, 1958.

Selected to open the Indiana University series of George A. Ball Visiting Professorships in Surgery, Dr. Miller participated in clinics, ward rounds, and conferences with the medical students and staff. He also was guest speaker at the Indianapolis Medical Society meeting, November 11.

The week-long visiting professorship was established five years ago as a memorial to a prominent Muncie industrialist and philanthropist. It has been held by a number of leading surgeons from the United States, England and Sweden.

\* \* \*

Kiwanis International unanimously adopted a resolution at its recent national convention in Chicago calling upon all of its clubs to actively support Red Cross and community blood banks as an "unparalleled field service." A Kiwanis Club in the Portland, Oregon, area has injected fun and fanfare into its action. Designated donors were "I've been tagged" cards to meetings. After giving blood, they are issued "I've been drained" cardboard pocket handkerchiefs.

\* \* \*

One Man's Family.—A thrilling moment in the history of Muskegon (Michigan) County Chapter's blood center occurred when eight Becklin brothers came to replace blood used by the wife of one of them. The youngest was eighteen. In addition to two sisters-in-law and a brother-in-law, the Becklin brothers—Eugene, Ralph, Armand, James, Robert, Donald, Lloyd, and

(Continued on Page 122)

in corticosteroid  
therapy of  
allergic diseases  
asthma-hay fever  
allergic rhinitis  
allergic dermatitis  
drug reactions



# Decadron\*

DEXAMETHASONE

to treat more patients more effectively

a new order of magnitude in therapeutic effectiveness  
a new order of magnitude in margin of safety

Excellent and good-to-excellent results are reported† with DECADRON in nearly all of 362 patients with various allergic disorders, including a number of cases who had failed to respond to other corticosteroids. **No major reactions** were observed in these extensive clinical studies even after four months of continuous therapy—DECADRON produced no peptic ulcer, no diabetes, no significant hypertension, no sodium retention, no potassium depletion, no edema, no undesirable psychic reactions, and no unusual or new side effects. Less than five per cent of patients experienced minor reactions, none of which prevented continuing administration of DECADRON.

Moreover, several investigators report that side effects induced by previous corticosteroid therapy such as gastric

intolerance, peripheral edema, headache, vertigo, muscle weakness, ecchymoses, flushing, sweating, moon facies, hypertension, hirsutism, and acne **often disappeared during therapy with DECADRON.** †Analysis of clinical reports.

**Dosage:** One 0.75 mg. tablet of DECADRON will replace one 4 mg. tablet of methylprednisolone or triamcinolone, one 5 mg. tablet of prednisone or prednisolone, one 20 mg. tablet of hydrocortisone, or one 25 mg. tablet of cortisone.

Detailed information on dosage and precautions is available to physicians on request.

**Supplied:** As 0.75 and 0.5 mg. scored, pentagon-shaped tablets in bottles of 100.

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(Continued from Page 120)

Charles—brought along two friends, thus making a total contribution of thirteen pints of lifesaving blood.

\* \* \*

At the annual meeting of the Association of Medical Record Consultants in Boston, October 17, 1958, the Association arranged for its first scientific assembly to be held in Chicago in January, 1960. The meeting will be open to anyone interested in the consulting phases of medical record library science and will extend over a two-day period. The objectives of this group emphasizes research, education and the evaluation and appraisal both qualitatively and quantitatively of medical records in all types of medical facilities to the end that there may be an improvement in the quality and efficiency in medical record departments in such facilities.

\* \* \*

M. K. Newman, M.D., Detroit, addressed the Eastern Section of the Detroit District Dental Society at the Whittier Hotel on December 1, 1958. His topic was "Occupational Neuromuscular Hazard in Relation to the Practice of Dentistry."

\* \* \*

**Educational Council for Foreign Medical Graduates.**—The results of the first worldwide American Medical Qualification Examination held September 23 in thirty United States examination centers and thirty foreign centers were announced late in November. The foreign centers were established in Latin America, the Far East, the Middle East and Europe. Statistics reveal that of

the 844 foreign-trained physicians taking the examination, 418 passed and will receive the educational certificate. These physicians are certified as possessing medical knowledge reasonably equivalent to that expected of graduates of approved American and Canadian medical schools and as having satisfactory facility in the English language. There were 226 candidates who came close to passing, in spite of language difficulties, to earn temporary certificates which will qualify them to study not more than two years as interns or residents in United States hospitals approved for internship and residency training. The American Medical Qualifications Examinations for 1959 are scheduled for February 17 and September 22. On March 25, 1958, the council administered the first examination of this type in seventeen stations in the United States, 51 per cent of the 300 applicants passing this initial test. Sponsoring organizations for the council are The Association of American Medical Colleges, the American Hospital Association, the American Medical Association and the Federation of State Medical Boards of the United States.

\* \* \*

Henry Krystal, M.D., Assistant Clinical Director, Department of Psychiatry, Detroit Receiving Hospital, was this year's recipient of the Research Award from the Michigan Society of Neurology and Psychiatry, for his paper, "The Physiological Basis of the Treatment of Delirium Tremens," which he presented to the Society on November 21, 1957. Dr. Krystal was educated at Goethe University, Frankfurt-am-Main, Germany, and

(Continued on Page 124)

# Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

March 2, 3, 4, and 5, 1959

Palmer House, Chicago

Daily Half-Hour Lectures by Outstanding Teachers and Speakers on subjects of interest to both general practitioner and specialist.

Panels on Timely Topics

Medical Color Telecasts

Teaching Demonstrations

Instructional Courses

Scientific Exhibits worthy of real study and helpful and time-saving Technical Exhibits.

The Chicago Medical Society Annual Clinical Conference should be a **MUST** on the calendar of every physician. Plan now to attend and make your reservation at the Palmer House.

FOR THE SLOW-TO-GROW CHILD B-VITAMIN SUPPORT...PLUS THE  
 PROTEIN-POTENTIATING ACTION OF L-LYSINE...PLUS THE  
 EXCEPTIONALLY WELL-TOLERATED HEMATINIC  
 PERFORMANCE OF FERRIC PYRO-  
 PHOSPHATE...AND THE IRON AND  
 B<sub>12</sub> ENHANCING ACTION OF SORBITOL  
 IN DELICIOUS CHERRY FLAVORED  
**INCREMIN<sup>®</sup>** SYRUP  
Lysine-Vitamins

**BUILDS IRON RESERVES  
 BOOSTS APPETITE  
 PROMOTES GROWTH**

Each daily teaspoonful dose (5 cc.) contains:

I-Lysine HCl .....	300 mg.
Vitamin B <sub>12</sub> Crystalline .....	25 mcgm.
Thiamine HCl (B <sub>1</sub> ) .....	10 mg.
Pyridoxine HCl (B <sub>6</sub> ) .....	5 mg.
Ferric Pyrophosphate (Soluble) .....	250 mg.
Iron (as Ferric Pyrophosphate) .....	30 mg.
Sorbitol .....	3.5 Gm.
Alcohol .....	0.75%

Bottles of 4 and 16 fl. oz.



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**CUMERTILIN<sup>®</sup>**

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- Suitable for long-term maintenance therapy.
- eliminates need for injections in certain cases, lengthens interval between injections in others
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**DOSAGE:** 1 to 3 tablets daily as required.

**SUPPLIED:** As orange tablets, in bottles of 100 and 1000. Also available—

**CUMERTILIN** Sodium Injection, 1- and 2-cc. ampuls, in boxes of 12, 25, and 100; and 10-cc. vials, individually and in boxes of 10 and 100

<sup>1</sup> Pollock, B. E., and Pruitt, F. W.: *Am. J. M. Sc.*, 226:172, 1953.

**THE G. A. INGRAM COMPANY**  
4444 Woodward Avenue, Detroit 1, Mich.

(Continued from Page 122)

received his B.S. and M.D. degrees at Wayne State University in Detroit. He received his psychiatric training at Detroit Receiving Hospital.

This award is an annual presentation for outstanding research in neurology, psychiatry, neurosurgery, neuropathology, neurophysiology, neuroanatomy, pharmacology pertaining to the nervous system, and other allied fields of interest. Competition is open to physicians living in Michigan, north-central Ohio in the area contiguous to the southern border of Michigan, and the Province of Ontario, Canada, in the area contiguous to the State of Michigan. Any desired information may be obtained by writing to Edgar A. Kahn, M.D., Chairman Research Award Committees, University Hospital, Ann Arbor, Michigan.

\* \* \*



C. G. CHILD, III, M.D.

Charles Gardner Child, III, M.D., became Professor of Surgery and Chairman of the Department of Surgery at the University of Michigan on January 1, 1959.

Doctor Child came to Michigan from Tufts University School of Medicine, Boston, where he served as Professor of Surgery and Chairman of the Department since 1953. At Ann Arbor, he will fill the post left vacant by the retirement of Frederick A. Collier, M.D.

Doctor Child was born February 1, 1908, in New York City and received his medical degree from Cornell in 1934.

Welcome, Doctor Child!

\* \* \*

The Chicago Ophthalmological Society will hold its Annual Clinical Conference on February 13-14, at the Drake Hotel in Chicago. For program and full information, write the Society (Mrs. Edward J. Ryan, Registrar), 1150 North Lorel Avenue, Chicago 51. (Registration fee \$45.00).

\* \* \*

The American College of Chest Physicians will present its Fourth Annual Postgraduate Course on Diseases of the Chest at the Sir Francis Drake Hotel, San Francisco, February 16-20, 1959. For program, write the College at 112 East Chestnut Street, Chicago 11.

\* \* \*

The New Orleans Graduate Medical Assembly will be held March 2-5, 1959, at the Roosevelt Hotel. For full information, write Maurice E. St. Martin, M.D., Secretary, 1430 Tulane Avenue (Room 103) New Orleans 12, Louisiana.

\* \* \*

The University of Michigan has granted 10,252 Doctor of Medicine degrees since 1851—out of a total of 20,037 doctoral-level degrees granted since the University was founded. Runner-up to the medics are the den-

(Continued on Page 126)



# Now—All cold symptoms can be controlled



Provides Triaminic for more complete and more effective relief from nasal and paranasal congestion because of systemic transport to *all* respiratory membranes—without drawbacks of topical therapy.<sup>†</sup>

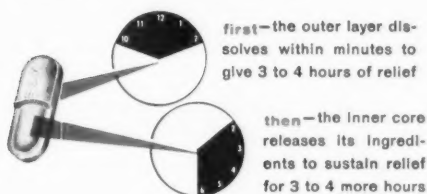
Provides well-tolerated APAP (N-acetyl-p-aminophenol) for prompt and effective analgesic and antipyretic action to make the patient more comfortable.

Provides Dormethan (brand of dextromethorphan HBr) for non-narcotic anti-tussive action on the cough reflex center in the medulla—as effective as codeine but without codeine's drawbacks.

Provides terpin hydrate, classic expectorant to thin inspissated mucus and help the patient clear the respiratory passages.

<sup>†</sup>Lhotka, F. M.: Illinois M. J. 112:259 (Dec.) 1957. Fabricant, N. D.: E. E. N. T. Monthly 57:460 (July) 1958. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958.

## Special "timed release" design



also available for those patients who prefer liquid medication: Tussagesic suspension

## Each TUSSAGESIC tablet provides:

TRIAMINIC®	50 mg.
(phenylpropanolamine HCl . . . . .)	25 mg.
pheniramine maleate . . . . .	12.5 mg.
pyrilamine maleate . . . . .	12.5 mg.)
Dormethan	
(brand of dextromethorphan HBr)	30 mg.
Terpin hydrate . . . . .	180 mg.
APAP (N-acetyl-p-aminophenol) . .	325 mg.

**Dosage:** One tablet in the morning, midafternoon and in the evening, if needed.

# Tussagesic<sup>®</sup> *timed-release* tablets

\*Contains TRIAMINIC to  running noses   and open stuffed noses orally

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# RESEARCH

Research directed at the creation of new, more effective therapeutic agents and support of basic research concerned with new therapeutic concepts are obligations that confront pharmaceutical industry.

Ordinarily small pharmaceutical concerns do not engage in these activities.

It is with pride, therefore, that we wish to point toward the fact that Meyer and Company are presently supporting four research projects in recognized institutions in the United States and Canada, and that these grants are proportionately far in excess of the funds ordinarily allocated by other pharmaceutical concerns.



## MEYER AND COMPANY

*Pharmaceutical Manufacturers*

Detroit 24, Michigan

(Continued from Page 124)

tists with 4,765 degrees and doctors of philosophy with 4,612.

\* \* \*

The University of Cincinnati announces a four-day course in "Industrial Eye Problems" March 9-12, 1959. For program, write Secretary of Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenue, Cincinnati 19.

\* \* \*



S. D. STEINER, M.D.

S. D. Steiner, M.D., Lansing, was appointed Medical Director of General Motors, effective December 1, 1958. Doctor Steiner succeeds Max R. Burnell, M.D., Flint, who retired November 1.

Since 1946, Doctor Steiner has been Medical Director of Oldsmobile in Lansing.

Congratulations and all success, Doctor Steiner.

\* \* \*

H. Marvin Pollard, M.D., Ann Arbor, directed an American College of Physicians postgraduate course in gastroenterology at Ann Arbor recently at which sixty-five physicians were in attendance. This program was the third in a series of eight being held at major medical centers in the East and Midwest. Thirty members of the University of Michigan staff and fourteen visiting lecturers were the "teachers" at this seminar, including J. Edward Berk, M.D., Audrey K. Brown, M.D., Louis A. Schwartz, M.D., of Detroit.

\* \* \*

Coleman Mopper, M.D., Detroit, was invited to present a scientific address at the University of Mexico, Mexico City, on November 19—in Spanish! Doctor Mopper accepted, realizing that he would have to master the Spanish language in a little over two months. How he did it is best described in his own words: "I immediately gave up golf and practically gave up medicine and studied nothing but Spanish. The vast majority of my studying was done in my automobile as I installed a tape recorder and purchased a course of Spanish records. After I presented my talk, the University of Mexico Professor of Dermatology complimented me both on my subject matter and my Spanish—and I must say I blushed with pride."

\* \* \*

A. E. Schiller, M.D., of Detroit addressed the American Academy of Dermatology in Chicago on December 9 on the subject "Voluntary Prepaid Medical Care in Michigan."

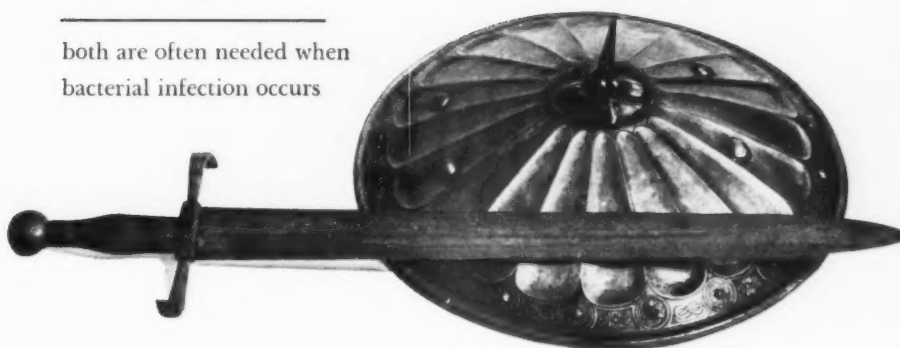
\* \* \*

"Compulsory Temporary Disability Insurance Programs" is the title of a new brochure developed by the Committee on Medical Care for Industrial Workers, a joint committee of The Council on Industrial Health and The Council on Medical Service of the American Medical Association. This new booklet is of interest

(Continued on Page 128)

- prompt, aggressive antibiotic action
- a reliable defense against monilial complications

both are often needed when bacterial infection occurs



for a direct strike at infection

**Mysteclin-V** contains tetracycline phosphate complex

It provides a direct strike at all tetracycline-susceptible organisms (most pathogenic bacteria, certain rickettsias, certain large viruses, and *Endamoeba histolytica*).

It provides the new chemical form of the world's most widely prescribed broad spectrum antibiotic.

It provides unsurpassed initial blood levels — higher and faster than older forms of tetracycline — for the most rapid transport of the antibiotic to the site of infection.

for protection against monilial complications

**Mysteclin-V** contains Mycostatin

It provides the antifungal antibiotic, first tested and clinically confirmed by Squibb, with specific action against *Candida (Monilia) albicans*.

It acts to prevent the monilial overgrowth which frequently occurs whenever tetracycline or any other broad spectrum antibiotic is used.

It protects your patient against antibiotic-induced intestinal moniliasis and its complications, including vaginal and anogenital moniliasis, even potentially fatal systemic moniliasis.

## MYSTECLIN-V

Squibb Tetracycline Phosphate Complex (Sumycin) and Nystatin (Mycostatin)

Capsules (250 mg./250,000 u.), bottles of 16 and 100. Half strength Capsules (125 mg./125,000 u.), bottles of 16 and 100.  
Suspension (125 mg./125,000 u. per 5 cc.) 60 cc. bottles. Pediatric Drops (100 mg./100,000 u. per cc.) 10 cc. dropper bottles.

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BRONCHITIS  
OR  
INFECTIOUS  
DERMATITIS?**

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RECOVERY  
PROCESS WITH  
VARIDASE BUCCAL** TABLETS

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Pearl River, New York

(Continued from Page 126)

to all physicians and may be obtained by writing the American Medical Association Council on Medical Service (or Council on Industrial Health) 535 North Dearborn St., Chicago 10, Illinois.

\* \* \*

"A Happy Solution to the Problem of Alcoholism" is the title of a very instructive and interesting brochure distributed by the Committee on Alcoholism of the Genesee County Medical Society (Flint, Michigan).

For copies of this excellent eight-page booklet, write the Genesee County Medical Society, 900 Begole Street, Flint 3, Michigan.

\* \* \*

Enrollment at Wayne State University totaled 24,430 during the last semester, including an increase in the College of Medicine from 274 to 319.

#### COMING MEETINGS

The American Association of Physicians and Surgeons will hold its sixteenth annual meeting at the Hilton Hotel, Fort Worth, Texas, April 2, 3 and 4, 1959.

The American College of Allergists Graduate Instructional Course and Annual Congress will be held March 15-20, 1959, in the Mark Hopkins Hotel, San Francisco, California. For additional information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

#### American College of Surgeons (Meetings in 1959):

*January.*—Sectional Meeting, Francis Marion Hotel, Charleston, South Carolina. January 19-21. Dr. Kenneth M. Lynch, Jr., Charleston, Local Chairman.

*February.*—Sectional Meeting, Shamrock Hilton Hotel, Houston, Texas, February 2-4. Dr. J. Griffin Heard, Houston, Local Chairman.

Sectional Meeting, Hotel Vancouver, Vancouver, B. C., February 26-28. Dr. T. R. Sargeant, Local Chairman.

*March.*—Four-Day Sectional Meeting for Surgeons and Nurses, Kiel Auditorium, St. Louis, Missouri, March 9-12. Dr. Frank McDowal, St. Louis, Local Chairman for Surgeons Meeting. Miss Joyce Brueggeman, R.N., Local Chairman for Nurses Meeting.

*April.*—Four-Day Sectional Meeting for Surgeons and Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, April 6-9. Doctors Harry S. Morton and Charles Edouard Hebert, Montreal, Local Chairmen for Surgeons Meeting. Miss Moyra Allen and Sister Denise Lefevre, Montreal, Local Chairmen for Nurses Meeting.

*September.*—Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2.

Additional information concerning any of the above meetings may be obtained from Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

The Fifty-fifth Annual Congress on Medical Education and Licensure will be held at the Palmer House in Chi-

(Continued on Page 130)

A workhorse  
"mycin"  
for  
common  
infections



## respiratory infections

**prompt,  
high blood levels**

**consistently  
reliable  
and reproducible  
blood levels**

**minimal  
adverse reactions**

With well-tolerated CYCLAMYCIN, you will find it possible to control many common infections rapidly and to do so with remarkable freedom from untoward reactions. CYCLAMYCIN is indicated in numerous bacterial invasions of the respiratory system—lobar pneumonia, bronchopneumonia, tracheitis, bronchitis, and other acute infections. It has been proved effective against a wide range of organisms, such as pneumococci, H. influenzae, streptococci, and many strains of staphylococci, including some resistant to other "mycins." Supplied as Capsules, 125 and 250 mg., vials of 36; Oral Suspension, 125 mg. per 5-cc. teaspoonful, bottles of 2 fl. oz.



# CYCLAMYCIN<sup>®</sup>

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SPRAINED  
OR  
SINUS  
INFLAMED?**

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LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY,  
Pearl River, New York

(Continued from Page 128)

cago, February 7-10, 1959. The first day's session will deal largely with specialism in medicine. The second day will deal with the role of research in the education of all physicians, and the third day will deal with the role of medical education in civilian and defense mobilization. All sessions are followed by open discussion or workshop.

\* \* \*

**Type is Type:** Just before the American Revolution, the head of a leaden statue of England's King George III that had been destroyed in Bowling Green, New York, was melted down and converted into type to be used in printing a pamphlet protesting British rule!

#### SUBMISSION OF BILLS FOR SERVICES RENDERED TO ARMY MILITARY PERSONNEL BY CIVILIAN HOSPITALS AND PHYSICIANS

As a general rule, civilian medical agencies are aware of the appropriate channels for submission of their charges for care furnished Army military personnel. They are informed of the correct procedure, either by prior arrangement with the appropriate military authority for routine medical care of personnel under their jurisdiction, or through notification to the patient's Commanding Officer, or the Surgeon of the Army area in which emergency type of service is rendered.

In situations where the above does not apply or when the civilian medical agency is in doubt concerning the normal procedure, bills may be submitted directly to Headquarters Fifth US Army, Office of Army Surgeon, 1660 East Hyde Park Boulevard, Chicago 15, Illinois, with a request that they be placed in appropriate channels for settlement.

Such bills should show name, rank, service number, organization and duty station of the patient, disease or disability treated, inclusive dates and nature of the services, and a brief statement of the incident leading to the treatment.

The above pertains *only* to care of military personnel, and should *not* be confused with the established procedures for the processing of claims for care of eligible military dependents under MEDICARE.

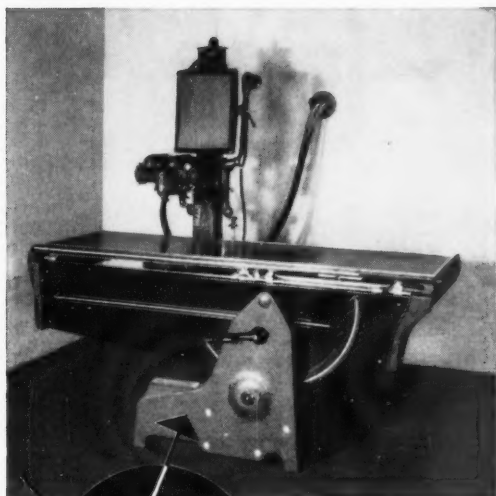
#### MICHIGAN'S DEPARTMENT OF HEALTH

(Continued from Page 110)

jobs done in those areas where a small increase in state aid will buy real gains.

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## In Memoriam

**PHILIP H. BROUDO, M.D.**, seventy-one, Detroit physician, died November 23, 1958. Born in Toronto, Doctor Broudo graduated from the University of Chicago and received his medical degree at the University of Illinois in 1910. He was active in the Zionist organization and a member of Congregation B'nai Moshe.

**CHARLES P. DOYLE, M.D.**, eighty-seven, Lansing physician, died November 21, 1958. Born in Grand Rapids, where he obtained his early education, Doctor Doyle made history when he became one of the first students to graduate from the first four-year medical class at the University of Michigan. He established his first medical practice in Milford, later moving to Frankfort before going into the Army Medical Corps during World War I. In 1918, Doctor Doyle moved to Lansing, where he helped the medical profession grow from the "horse and buggy" days to today's modern era. He was twice Chief of Staff at St. Lawrence Hospital. His affiliations included St. Mary's Cathedral, Lansing Lodge No. 196 B.P.O. Elks, Knights of Columbus, and the Country Club of Lansing.

**AARON R. EDWARDS, M.D.**, forty-six, Ann Arbor pediatrician, died November 9, 1958, in a fire at his home which also took the lives of his two daughters. Doctor Edwards was born at Marysville, Ohio, was graduated from Cornell University College in 1933, and received his medical degree from that institution's Medical College in 1941. He served during World War II as a Captain in the U. S. Army Air Corps and upon his discharge did residency work at Harper Hospital in Detroit and at University Hospital in Ann Arbor. He had operated a private practice in Ann Arbor since 1946 and was a member of the pediatrics staff at St. Joseph Mercy Hospital.

**HENRY B. STEINBACH, M.D.**, seventy, Detroit physician, died November 21, 1958. Doctor Steinbach was born in Dorchester, Iowa, and graduated in 1920 from University of Iowa Medical School. He interned at Grace Hospital before setting up his practice in Detroit in 1921.

**J. ORVILLE THOMAS, M.D.**, eighty-one, Lapeer County physician, died October 20, 1958.

Doctor Thomas, a native of Forest, Ontario, was a graduate of the Detroit College of Medicine and served a year's internship at Charing Cross Hospital in London, England. He practiced medicine in Lapeer County, Michigan, for more than sixty years, and, in 1949, the residents of North Branch organized a "Dr. Thomas Day," in appreciation.

Doctor Thomas served as president of the local school board and as health commissioner. He was a Mason and a Rotarian.

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(Continued from Page 94)

stead of being clustered about say, the right hand and forearm.

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<sup>1</sup>Sadove, Max S. and Schwartz, Lester: An Evaluation of Buffered Versus Nonbuffered Acetylsalicylic Acid, *Postgraduate Medicine*; 24:183, August, 1958.  
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*Acknowledgments of all books received will be made in this column, and this will be deemed by us as full compensation to those sending them. A selection will be made for review, as expedient.*

**HUMAN PARTURITION**—Normal and Abnormal Labor. By Norman F. Miller, B.S., M.D., F.A.C.S., A.C.O.G., Professor of Obstetrics and Gynecology, University of Michigan Medical School; T. N. Evans, A.B., M.D., F.A.C.S., A.C.O.G., Late Associate Professor of Obstetrics and Gynecology, University of Michigan Medical School; R. L. Haas, A.B., M.D., F.A.C.S., A.C.O.G., Late Associate Professor of Obstetrics and Gynecology, University of Michigan Medical School. Baltimore: The Williams & Wilkins Company, 1958. Price \$7.50.

This is a very comprehensive treatment of the subject of labor and obstetrics. It includes the anatomy of the female pelvis and its relationship to the fetus in both normal and abnormal conditions. There are two excellent chapters, "Induction of Labor" and "Bleeding in Late Pregnancy." The chapters are written in an outline form with the main topic stated. This is followed by various headings with detailed explanations. This book is an ideal supplement to the standard texts on Obstetrics and is of great value to any doctor doing obstetric work.

J.E.P.

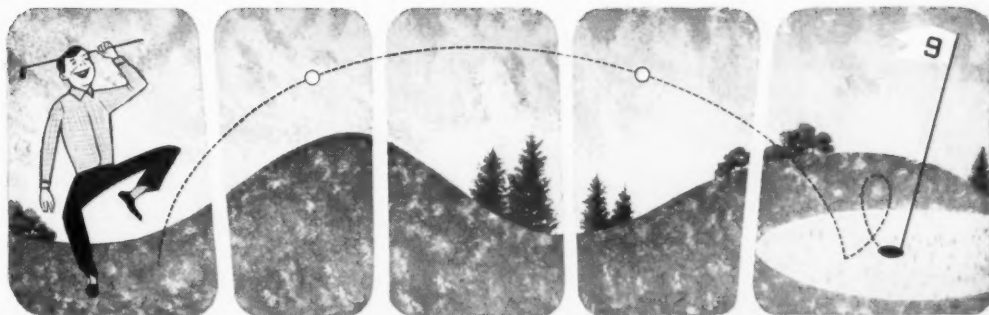
**HENRY FORD HOSPITAL INTERNATIONAL SYMPOSIUM—RETICULAR FORMATION OF THE BRAIN.** Editors, Herbert H. Jasper, Montreal Neurological Institute; Lorne D. Procter, Division of Neurology and Psychiatry, Henry Ford Hospital; Robert S. Knighton, Division of Neurosurgery, Henry Ford Hospital; William C. Noshay, Section of Neurology, Henry Ford Hospital; Russell T. Costello, Department of Medicine (Neurology), Wayne State University. 766 pages. Boston and Toronto: Little Brown and Company, 1958. Price \$16.00.

This distinguished volume provides up-to-date knowledge of the brain's reticular formation system, that part of the nervous system which now appears to serve as a chief center of neurophysiological integration and function. In this system, the authors include the non-specific thalamic nuclei and related gray matter in the diencephalon, septal region, and amygdala, "with reverberating circuits of enormous complexity."

Seventy-two specialists from different parts of the world pooled their laboratory and clinical findings on the reticular system during this truly "memorable symposium," held at Henry Ford Hospital, March 14, 15, and 16, 1957. Although the program devoted itself also to neuro-anatomy and behavioral studies, by far its largest division was that of neurophysiology.

This council may be conceived as a progressive development of the symposium on Brain Mechanisms and Consciousness held at Quebec, 1953. The names of its renowned contributors and their comprehensively ranging topics, are too numerous even to list here. It is but further tribute to this excellent digest to wish that the work of many others might have been included in it. The

(Continued on Page 138)



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(Continued from Page 136)

multiple authorship succeeds in reflecting the high-spirited keen-mindedness lived in each one of the conference sessions. The book is packed with helpful insights regarding neurophysiological behavior and the integration of elements of the nervous system.

To illustrate, Herbert H. Jasper observes, "When the brain really does act as a whole with uniformity of electrical pattern throughout, as during petit mal seizures, we may have unconsciousness. Differential organization of activity is required for conscious integrative function. If the reticular system is of importance in such consciousness processes, it must possess properties of differential organization. In this process, inhibitory mechanisms probably play a leading role.

The Introduction expresses the sincere hope that scientific investigation of the reticular formation "will provide a means, through experimental psychology and psychiatry, for a more scientific basis for understanding the dynamics of these disciplines." Certainly one cannot study this faithful report of careful research without wholesomely marvelling at the power of the human mind.

This brief review can hardly do justice to this basic compilation which justifies the publisher's claim for it as being "a landmark in neurological literature." It properly belongs in every well developed behavioral science library.

The volume is of pleasing format. Extensively it uses

well done and clear diagrams, illustrations, and black and white plates. It also includes a fairly comprehensive subject index.

J.M.D.

**PATHOPHYSIOLOGY IN SURGERY.** By James D. Hardy, M.S. (Chem.), M.D., F.A.C.S., Professor and Chairman, Department of Surgery, and Director of Surgical Research, University of Mississippi Medical Center; Surgeon-in-Chief, Hospital of the University of Mississippi; Chief Surgical Consultant, Jackson Veterans Hospital and Mississippi Tuberculosis Sanatorium, Baltimore: The Williams & Wilkins Company, 1958. Price, \$19.00.

This is a rather specialized book of physiology, of vital importance to anyone doing general surgery. The author has condensed a vast amount of literature that has appeared since World War II on the general subject of surgical physiology and pathophysiology. He has covered an immense amount of material that has appeared in surgical literature and has organized and condensed it so the reader is kept abreast of the present trend of thought without having to be overwhelmed by the vast amount of extraneous material encountered in the current literature. The book is well illustrated and the pros and cons of various physiological problems are presented. The author cleverly uses charts and sketches to summarize and correlate pathophysiological data.—J.M.H.

(Continued on Page 140)



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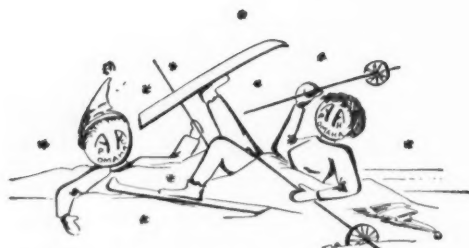
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•HARDY, J. A.: *Obstet. & Gynec.* (Nov., 1956)





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(Continued from Page 138)

**THE MANAGEMENT OF EMERGENCIES IN THORACIC SURGERY.** By John Borrie, M.B.E., Ch.M., F.R.C.S. (Eng.), F.R.A.C.S., Thoracic Surgeon, Dunedin Hospital and Southern Metropolitan Region, New Zealand; Senior Lecturer in Thoracic Surgery, University of Otago Medical School, Formerly, Hunterian Professor and Jacksonian Prizeman, Royal College of Surgeons, England; Assistant Thoracic Surgeon, Newcastle upon Tyne, England; New Zealand Nuffield Surgical Fellow. Foreword by Sir Russell Brock. New York: 1958. Appleton-Century-Crofts, Inc. Price, \$10.00.

This beautifully arranged text approaches thoracic procedures from the anatomic, physiological and pathological aspects. The book is extremely well written, being very concise and practically in outline form, each chapter being summarized at the end. The approach to thoracic emergencies is taken up methodically from the chest wall into the pleural cavity, lungs, esophagus, mediastinum, diaphragm and cardiac areas. This book is very practical and would be an important addition to the library of any physician concerned with thoracic emergencies. Its concise form and organization lend it well to use for students.—J.M.H.

**CIBA FOUNDATION COLLOQUIA ON ENDOCRINOLOGY.** Volume 12. Hormone Production in Endocrine Tumors. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Maevae O'Connor, B.A. With 58 Illustrations and Cumulative Index to Volumes 1-12. Boston: Little, Brown & Co. Price \$9.00.

The papers deal primarily with biochemical studies using micromethods of chemical assay of the hormone substances. The book brings together valuable background material for the research worker, the biochemist, and the endocrinologist. Each paper is followed by a general discussion. A wide range of endocrine tumors is discussed.

This book is recommended for the library of research institutions, primarily, and to those researchers in this field of special interest. An extensive bibliography is presented.

R.W.B.

**MECHANISMS, DIAGNOSIS AND MANAGEMENT HEAD INJURIES.** By E. S. Gurdjian, M.D., Professor of Neurological Surgery and Chairman of the Department of Neurosurgery, Wayne State University College of Medicine; Department of Neurosurgery, Grace and Detroit Memorial Hospitals, and J. E. Webster, M.D., Associate Professor of Neurological Surgery, Wayne State University College of Medicine; Department of Neurosurgery, Grace and Detroit Memorial Hospitals, Boston and Toronto: Little, Brown and Company, 1958. Price \$14.00.

The authors present an interesting, rather brief survey on the historical aspects of head injuries in their treatment from prehistoric up to the present time. The book summarizes the clinical, experimental and neurosurgical

(Continued on Page 142)

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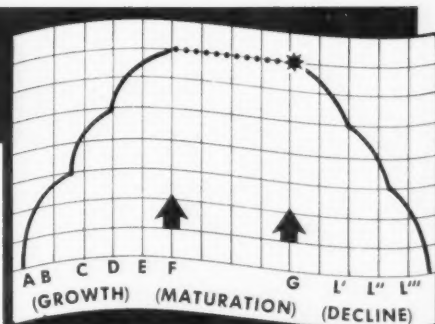
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\*Chappel, C.C., J.A.M.A., 162: 1414, (Dec. 8) 1956

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*(Continued from Page 140)*

experiences of the authors. The anatomy, pathology and physiology are well presented and discussed. Many of the diagnostic technics, clinical manifestations and treatment are demonstrated by means of photographs and drawings. They have correlated the experimental work done in trauma with the clinical material available, which has resulted in a very practical manual.

The book is well illustrated, and pictures demonstrate the underlying mechanisms clearly. This book should be valuable to every doctor treating present-day head injuries.—J.M.H.

**THE NEUROLOGIC EXAMINATION.** Incorporating the Fundamentals of Neuroanatomy and Neurophysiology. Second Edition. By Russell N. DeJong, M.D., Professor of Neurology and Chairman of Department of Neurology, University of Michigan Medical School. 1078 pages. 368 illustrations. New York: Hoeber-Harper, 1958. Price, \$20.00.

This praiseworthy exceptional textbook on the fundamentals of neurology and neurologic diagnosis, is one in which every Michigan physician may justly take personal satisfaction and fraternal pride. It stands as a worthy revision of the first edition (1950), which found acceptance and acclaim throughout the medical world, and it duly realizes advantages accruing from originating upon that kind of eminence. It is built around a finely discriminating appreciation of neurologic structure and function (rather than around the neurological disease entity), demonstrating nice recognition of the workings of the nervous system as its basic frame of reference. It correlates neurological organization and utility in a way that enables the explanation of neurologic disorder as consisting of functional deviation understandably necessitated by structural change.

It is a scholarly work basically oriented around health, for the purpose of understanding the deviation of health. Its life-affirming orientation distinguishes it from the traditional text which tends to be oriented around disease, thus obscuring the significance of "disease" as health deviation. Dr. DeJong's method of presentation of the neurological disorders safeguards itself against the ever-present possibility of overlooking man in order to study disease process. This scientific methodology upholds a wholesome insight: thorough appreciation of what health is, is indispensable for the humane study of health's vicissitudes.

Like the first edition, this second edition is divided into ten parts. The first six parts cover history taking, neurological physical and mental examinations, and thorough studies of the several neurological systems (sensory system, cranial nerves, motor system, reflexes, and autonomic nervous system). Parts seven and eight include diagnosis and localization of disease of the peripheral nerves, nerve roots, spinal cord, and intracranial region. Part nine contains special methods of examination in the states of disordered consciousness, suspected hysteria and malingering. Part ten covers spinal puncture and the examination of the cerebrospinal fluid.

The author's studious detailing of anatomy, physiology, and methods of examination, is most helpful for the practical guidance of every pupil and practitioner of medicine. His careful consideration of the particulars as well as of the whole of neurological structure and functioning, is of special importance for every reader who is interested in finding out the sum and substance of his subject. A basic work reporting established neurological findings, it does not purport to detail therapy, except in the sense that it plainly implies: to be able to make an accurate diagnosis points the direction to the most helpful therapeutics currently available.

The book has a pleasing format. Its print is very legible, and its illustrations are clear. In addition to lists of references following individual chapters, it has a General Reference section. Its Index is helpfully full, containing a goodly number of cross references. Its purchaser will get his money's worth on an economical investment. True to its publisher's claim, "as a practical, complete, and lucid integration of basic neuroanatomy and physiology and their clinical implications, this volume stands unique."

J.M.D.

**EMERGENCY WAR SURGERY.** U. S. Armed Forces Issue of Nato Handbook Prepared For Use By the Medical Services of NATO Nations. United States Department of Defense. For sale by the Superintendent of Documents. Washington, D. C.: U. S. Government Printing Office, 1958. Price, \$2.25.

This compact book, which is designed to fit in the pocket of a field uniform, is concise and practical. It is a carefully written book and covers the care of casualties from forward areas on the battlefield through to the

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evacuation hospitals. The principles and practices described are well adapted to the treatment of trauma such as occurs in modern civilian life. It is a "must" for those interested in traumatic surgery.

Each chapter contains a summary detailing the practical application of the special procedures and principles described. It covers injuries ranging from missile, thermal, cold, crush, blast, chemical, radiation, and multiple injuries. The amount of material in this small volume is so vast it is practically in outline form. It is practical, and contains charts that are handy in that they translate anesthetics, narcotics, antibiotics and drugs of various kinds with their commonly used names in the United States, United Kingdom, and France. It contains many useful conversion tables on weights and measures. The index is rather complete and handy.

This is probably one of the most practical and concise textbooks that has ever been published on emergency war surgery, and well deserves a place in the library of those interested in traumatic surgery.

J.M.H.

**THE ETERNAL SEARCH.** The Story of Man and His Drugs. By Richard R. Mathison. New York: G. P. Putnam's Sons, 1958. Price, \$5.95.

This is a most unusual and highly entertaining account of medical and pharmaceutical lore, of interest not only to the physician, but to those in allied professions of pharmacy, nursing, and medical technology as well. It is medical history at its best, written in a form that is

light, interesting, and easy to pick up for spare moments of short perusal, for bedtime reading, or the like. It will hold your interest from the time you first crack the cover, for it is not a text book.

It is developed and organized by ailments and types of drugs, and not chronologically. Primitive remedies and customs, old myths and beliefs, quackeries, sexual practices and rites, embalming, midwifery, and many other topics in addition to the many various old drugs, remedies, and even cosmetics are discussed. Many of the words and expressions of medical lore are traced to their origin.

This book is heartily recommended to every physician.

R.W.B.

**PEDIATRIC METHODS AND STANDARDS.** Department of Pediatrics, School of Medicine, University of Pennsylvania. Edited by Fred H. Harvie, M.D., Associate Professor of Clinical Pediatrics. Third Edition. Philadelphia: Lea & Febiger, 1958. Price, \$4.50.

This concise booklet is a pediatric dictionary. It cannot be reviewed; it has to be used. There are twenty-three chapters covering all the pediatric essentials, including History Taking, Laboratory Tests, Tables of Normal Values, Studies of Renal, Neurologic, Endocrine and Liver Functions, Therapy, Dosages and Pediatric Surgery. All the material is well up to date and a guide to good current pediatric practice in hospital and office.

R.S.S.



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## Communications

### DRIVERS, NOT CARS

I'm disturbed by recent *Free Press* editorial comment which tended to minimize the importance of driver failure in car accidents in favor of mechanical defects of the cars themselves.

Mechanical shortcomings are important and, of course, should be prevented by all means possible. Admittedly no statistics are 100 per cent accurate, but at present we have no other choice than to take the available figures arrived at by the responsible law enforcement and safety agencies which study the accidents you and I get into.



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7. Bracket furnished for wall mounting.
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Their present conclusions are that mechanical defects account for only about 8 per cent of traffic accidents.

In three years, Michigan has made unusual progress in reducing highway deaths.

No safety expert will give all the credit to any one factor, but certainly we cannot overlook a student driver training program which already is bearing fruit, a state speed law to caution our enthusiasm with the accelerator, more state troopers to remind us of our mistakes, and an educational program (participated in actively by the *Free Press*) aimed to help every driver be a better driver.

Cars are safer than they were three years ago, but that alone has not accounted for the decreased deaths, else the same degree of improvement would be noted nationwide, which it isn't.

How many of us in the last year have never been careless behind the wheel, have never passed when we should not have, have never driven too fast, have never taken a chance, have never been discourteous to one of our fellow motorists, and have always observed all the traffic rules? I am sure that most of us have been guilty. I know I have.

JOHN R. RODGER, M.D.  
Chairman, Traffic Safety  
Committee of The Michigan  
State Medical Society

Bellaire

—From *Detroit Free Press*, Oct. 26, 1958

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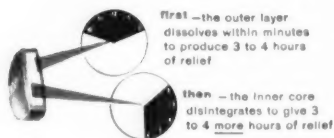
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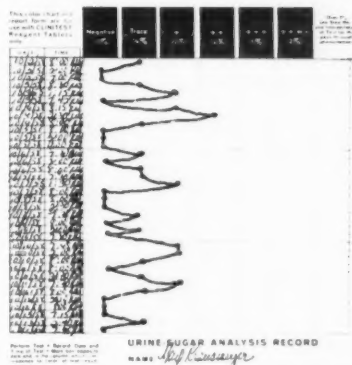
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Source: Joslin, E. P.; Root, H. F.; White, P., and Marble, A.: The Treatment of Diabetes Mellitus, ed. 9, Philadelphia, Lea & Febiger, 1952, pp. 701-702.

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